

LOST CREEK ANALYSIS AREA

ENVIRONMENTAL ASSESSMENT

No. OR 090-EA-98-20

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PRELIMINARY FINDING OF NO SIGNIFICANT IMPACT

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

The Bureau of Land Management (BLM) proposes to implement forest management activities in the Lost Creek Analysis Area. The proposed projects would occur within Matrix Lands and selected Riparian Reserves (RR) as designated in the Record of Decision for the Northwest Forest Plan Environmental Impact Statement (SEIS/ROD) pp. 7. The analysis area is approximately 15 miles southeast of Eugene, near the town of Dexter, Oregon. It includes Lost, Guiley, Osage, East Osage, Carr, Middle, and Anthony creeks. The total analysis area is **35,321** acres in size. BLM manages **13,768** acres (39 percent) of the analysis area, the U.S. Forest Service manages **6,841** acres, and the remaining lands are private.

The proposed harvest activities are located in T. 19S., R. 3W. ; T. 19S., R. 2W. ; T. 19S., R. 1W. ; T. 20S., R. 3W. ; T. 20S., R. 2W. and R. 20S., R. 1W.; T. 20S., R. 1E. of the Willamette Meridian.

The purpose of this Environmental Assessment (EA) is to analyze the effects of (1) harvesting timber, (2) road construction, improvement, and decommissioning, (3) riparian treatments, and (4) creation of snags in the analysis area.

Management for this area includes the need to:

- Harvest merchantable timber to help meet the Eugene District Probable Sale

Quantity (PSQ).

- Increase the productivity of General Forest Management Area (GFMA) lands by thinning overstocked stands.
- Manage the transportation systems adjacent to harvest areas and areas damaged by the 1997 floods, through road closures, improvements, and decommissioning to maintain or improve wildlife habitats, water quality, hydrologic function, and to reduce future road maintenance needs.
- Conduct density management thinnings in RR to increase stand complexity.
- Create snags to meet 40 percent cavity nester population in the GFMA, and 100 percent cavity nester population in the RR.

Areas considered for timber harvest are outside the Late-Successional Reserve (LSR), and Key watersheds.

1.2 Conformance

This EA is tiered to the *Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl*, April 1994, and the *Eugene District Record of Decision and Resource Management Plan (RMP)*, June 1995.

Actions described in this EA are in conformance with the Aquatic Conservation Strategy (ACS) Objectives listed on page B-11 of the Northwest Forest Plan (NFP),

and in **Appendix E** of this EA. These documents are available for review at the Eugene District Office of the BLM, Eugene, Oregon.

The Analysis File contains additional information used by the interdisciplinary team (IDT) to analyze impacts and alternatives and is hereby incorporated by reference.

On November 4, 1996, "Interim Guidance for Survey and Manage Component 2 Species: Red Tree Vole" was issued to the field to use to implement component 2 of the Survey and Manage Standard and Guideline Under the NFP Record of Decision (BLM Instruction Memorandum No. Or-97-009). This 1996 memorandum contained both the management recommendations (interim guidance), and the survey protocol for the red tree vole. Instruction Memo 98-105 extended the interim guidance memo through FY 99 or until superseded by revised direction. The Proposed Action and alternatives are in conformance with this guidance.

Plan maintenance documentation postponing surveys for 32 Component 2 and Protection Buffer species was recently completed ("Plan Maintenance Documentation, USDI Bureau of Land Management, To Change the Implementation Schedule for Survey and Manage and Protection Buffer Species," approved March 3, 1999). The Proposed Action and alternatives are in conformance with the direction provided in the Plan Maintenance Documentation. The implementation of the plan maintenance is provided for by BLM planning regulations (43 CFR 1610.5-4).

The effect of the plan maintenance action was analyzed in an environmental assessment, "To Change the Implementation Schedule for Survey and Manage and Protection Buffer Species," issued October 7, 1998 ("Schedule Change EA"). The analysis contained in the Schedule Change EA is incorporated into this document by reference. Both the Schedule Change EA and the Plan Maintenance Documentation are available for viewing at the Eugene BLM District Office or on the internet at <http://www.or.blm.gov/nwfp.htm>.

1.3 Monitoring

Monitoring guidelines are established in the 1995 RMP/ROD, Appendix D, and the 1994 NFP Standards and Guidelines, pp. E-1 to E-10.

1.4 Scoping

The scoping process identified the agency and public concerns relating to the proposed projects, and defined the issues and alternatives that would be examined in detail in the EA. The public was informed of the planned EA through letters to those on the Resource Area's mailing list, and to those receiving the *Eugene District Planning Update*.

Two public scoping meetings were held: one on January 7, 1998, and the other on March 3, 1998. A field trip was also conducted for interested parties on April 9, 1998. There were 16 comment letters or phone conversations from the public that identified issues or concerns. A copy of the scoping mailing list, and the public identified issues is

in the Analysis File.

1.5 Issues

Scoping by the IDT and public input identified the following **ten** issues:

1. What would be the effect of harvesting and road management on the timing and magnitude of peak flow? Specifically, consider (1) timber harvesting within the transient snow zone and (2) road construction, restoration, and decommissioning in the RR.
2. What would be the effect of harvesting activities and road management activities on erosion and sediment delivery to water bodies? Specifically, consider restoration projects and road construction in the RR in proposed Harvest Areas 7-10, and flood projects.
3. What would be the effect of timber and road management activities in the RR? Specifically, consider the effects of planned activities on water temperature, soil productivity impacts from harvesting and roads and future recruitment of coarse woody debris (CWD).
4. What would be the impacts of harvesting activities on the northern spotted owl (NSO) nest site adjacent to a harvest area?
5. What would be the impacts of harvesting and road management activities on the Critical Habitat Unit (CHU)? Proposed Harvest Areas 2, 5, 6-9 and 14 are in the

CHU.

6. What would be the effect of harvesting 80+ year-old stands on the remaining 80+ year-old stand network and Late-Successional species?
7. What would be the effect of harvesting activities adjacent to 200+ year-old stands? Specifically, the effect of harvesting in proposed Harvest Areas 12, 14 and 5E.
8. What would be the impacts of snag creation on wildlife including impacts associated with noise from blasting trees for snag creation?
9. What are the impacts for adjacent landowners and people who use the watershed? Specifically, what are the impacts to landowners and what are the visual and road closure impacts to recreationists and other users?
10. What would be the impact of harvesting and road management on survey and manage species?

1.6 Issues Identified But Eliminated From Detail Analysis

What are the effects of harvesting activities on “steep” slopes?

This issue will be incorporated into Issue #2. Additionally, all areas with high risk of instability were withdrawn from timber harvest.

Impacts to 32 Survey and Manage and

Protection Buffer Species.

No site specific surveys were completed for any of the 32 Component 2 or Protection Buffer species listed in the Schedule Change EA except for *Buxbaumia viridis*, *Rhizomnium nudum*, *Tetraphis geniculata*, *marsupella emarginata* var. *Aquatica*. Informal surveys for these species were conducted on some of the harvest areas before it was determined by an interagency team that it was not technically feasible to survey for these species. Individuals of *Sarcosoma mexicana* were found, incidental to

other surveys, and appropriate management actions would be implemented under all alternatives. However, it is possible that additional individuals may reside in the project area. The issue of how the Proposed Action and alternatives would impact potential locations of *Sarcosoma mexicana* was not analyzed because impacts are not expected to exceed those anticipated in the Schedule Change EA.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section describes alternatives identified by the IDT, alternatives eliminated from detail study, and comparison of alternatives. Design features associated with these alternatives and detail information can be found in the Appendices.

The terms “decommission” and “full decommission” are used frequently within this document. These terms are defined as follows:

Decommission - A road segment would be closed to vehicles on a long-term basis, but may be used again in the future. Prior to closure, the road would be prepared in order to avoid future maintenance needs. It would be left in an “erosion resistant” condition by establishing cross drains and removing fills in stream channels and potential unstable fill areas. The road would be closed with a device similar to an earthen barrier (tank trap) or equivalent. The road would not require future maintenance.

Full Decommission - Roads determined, through an interdisciplinary process, to have no future need would be subsoiled, seeded, mulched, and planted to restore vegetation. Natural hydrologic flow would be restored. Cross drains, fills in stream channels, and potentially unstable

areas would be removed to restore natural hydrologic flow.

The road would be closed with a device similar to an earthen barrier (tank trap) or equivalent. The road would not require future maintenance. Roads receiving this treatment would be removed from all road inventories.

Culverts would be removed under both the decommission and full decommission options.

2.1 *Alternative I - Proposed Action*

(Refer to **Appendix A** for Project Design Features, **Appendix B** for Harvest Area Details, and **Appendix C** for Road Construction and Closure Summary) This alternative includes several projects described below.

2.1.1 Timber Harvest Activity in the Matrix

This alternative consists of five regeneration harvest areas (132 acres), and eight thinning harvest areas (690 acres). All perennial nonfish-bearing streams retain the interim RR width of one site potential tree height (180 feet slope distance) on each side of the stream channels. All fish-bearing streams retain the interim RR width of two site potential tree heights (360 feet slope distance) on each side of the stream channels. Intermittent streams

retain the interim RR width of one site potential tree height (180 feet slope distance) on each side of the stream channel. Wetlands of less than one acre in size would be buffered to the extent of the riparian vegetation.

2.1.2 Density Management Within Riparian Reserves Area

The current conditions of the RR are as follows:

- Very few snags
- Very few down logs
- Limited diversity of tree species - approximately 90 percent of the trees are Douglas fir trees

Management actions are proposed in selected RR areas where silvicultural practices can be used to achieve the following:

- Accelerate growth of trees
- Increase vegetation diversity
- Increase the number of snags
- Maintain and increase the retention of green crowns

These actions would manage stocking and acquire desired vegetation characteristics in harmony with the ACS objectives. The RR design features are intended to maintain the integrity of the streams and ponds in accordance with the ACS, to increase the stands' complexity, and to move the stands closer to

reaching late seral stage. Late seral stage stands contain large and small trees of mixed species, with well-developed lateral crown structure, multistoried canopies, and abundant sources of CWD. (See **Appendix A, Design Features for Riparian Reserve Actions**)

The IDT identified areas in the thinning harvest areas where riparian thinning could occur. Riparian Reserve areas were selected for management based on (1) access without building a new or temporary road, (2) slope of less than 60 percent, and (3) ability for RR to respond. The exact location of the riparian thinning would be determined during the layout and marking phase, but the following are acres reviewed for treatment:

- Estimated acres examined for riparian management potential - **823**
- Estimated acres proposed for treatment - **245**
- Estimated acres that would actually be treated - **30** percent of the proposed **245**, or about **70** acres
- Number of proposed Harvest Areas that could potentially receive management actions - **7**

Management actions on selected RR would include thinning and snag creation. Throughout the watershed, snag creation would occur as

described under 2.1.4 Restoration. Proposed Harvest Areas 2A, 5, 7, 8, 10, 11, and 12 have RR areas that could potentially receive treatment (see Appendix D - maps). The maps show potential treatment areas, not the actual areas to be treated.

The proposed thinning harvest areas are within RR of fish-bearing streams with the exception of proposed Harvest Area 12.

The table below summarizes the type of harvest, affected Land Use Allocation (LUA), and affected acres for the Proposed Action. These are estimated acres and volumes.

TYPE HARVEST	LAND USE ALLOCATION	ACRES	Regen Harvest Acres (Skyline)	Regen Harvest Acres (Grnd)	CT Harvest Acres (Heli/Skyline)	CT Harvest Acres (Grnd)	DMT Harvest Acres (skyline)	DMT Harvest Acres (Grnd)	Volume (MBF)
Regeneration	Matrix	132	41	91					4,620
Thinning	Matrix	690			0/441	249			5,175
Density Management	Riparian Reserve (245 potential acres)	70 est.					59	11	896
TOTAL		892							TOTAL 10,691

Regen - Regeneration Harvest
CT - Commercial Thinnings
DMT - Density Management Thinnings

Heli - Helicopter Yarding
Grnd - Ground based Yarding
MBF - Thousand Board Feet

2.1.3 Roads

Roads within and adjacent to proposed Harvest Areas were selected to be decommissioned based on:

- Future use within the next 10-15 year.
- Whether the proposed Harvest

Area would be within 0.25 miles of an existing road, if the selected road was decommissioned.

- High risk to resources, water quality, and unstable locations.

If roads were not going to be needed within the next 10-15 years for forest management purposes, they were

considered for decommissioning. If roads were in regeneration areas, and another existing road was within 0.25 miles, the road in question was considered for full decommissioning. Roads that are not expected to be needed in the future were also considered for full decommissioning. If a road may be needed in the future, especially in potential thinning areas, the road was considered for decommissioning.

Planned road decommissioning would be completed by applying Best Management Practices (BMP) and design features as listed in Appendix A, and upon concurrence from private landowners, who may have current rights or future need of roads within a Reciprocal Right-of-Way Agreement area.

Dirt Road Constr. (Miles)	Dirt Road Decom. (Miles)	Dirt Road Fully Decom. (Miles)	Rock Road Constr. (Miles)	*Road improve. (Miles)	Road improve and Decom. (Miles)	Road improve. and fully decom. (Miles)	Existing road decom. / full decom. (Miles)	Net increase roads (Miles)
6.34	5.27	1.08	0.04	3.79	1.25	0.68	3.77	-5.66

Decom. - Decommission; Roads to be blocked and treated as necessary to restore hydrologic functions after completion of timber sale contract.

Full Decom. - Full Decommission; Roads to be decommissioned, subsoiled, and planted after completion of timber sale contract.

* - Road improvement for the road in Area 10 would have a failing log culvert that is under 30 feet of fill replaced, and another culvert on this road would be replaced, along with five additional cross drain culverts installed.

An estimated 6.34 miles of dirt road have been proposed for construction. An estimated 5.27 miles of dirt road would be decommissioned and 1.08 miles of dirt road would be fully decommissioned. An estimated 0.04 miles of rock road has been proposed for construction. Approximately 0.04 miles of the newly constructed rock road would remain after harvest. An estimated 3.79 miles of improvement is proposed. An estimated 1.25 miles of existing road that is to be improved would be decommissioned

after harvesting. An estimated 0.68 miles of existing road that is to be improved would be fully decommissioned after harvesting. An estimated 3.77 miles of existing road would be decommissioned.

2.1.4 Restoration Projects

There are two roads that were damaged during the floods in 1996. In addition to the road work, snag creation is proposed as a restoration project.

2.1.4.1 Flood damaged roads

- Road No. 19-2-23

Road No. 19-2-23, needed to access proposed Harvest Area 11, was damaged during the 1996 flood. There is a road edge slip-out that would not be fixed for the logging of the proposed Harvest Area, because there are no safety or stability concerns. After harvesting has occurred, this road would have the first 0.4 miles decommissioned; the rest of the road (0.34 miles) would be fully decommissioned.

- Road No. 20-1-14.1 Seg. B

Road No. 20-1-14.1 Seg. B had a portion of the road damaged during the 1996 flood. This road is needed to access BLM and private land with authorized use under a Reciprocal Right-of-Way Agreement. The proposal is to realign Road No. 20-1-14.1 Seg. B, 24 feet east into the cutbank on stable ground, and provide for adequate drainage. The slump area would be shaped, contoured, and seeded for stabilization.

- Road No. 20-1-14.1 Seg. C

Road No. 20-1-14.1 Seg. C (0.64 miles), Road No. 20-1-13.3 (0.38 miles), and Road No. 20-1-13.4 (0.16 miles) would not be utilized for the next 10-15 years, and they would be decommissioned.

2.1.4.2 Snag creation

The Proposed Action is to manage for cavity nesting wildlife in the Lost Creek Watershed. This involves the creation of snags for 40 percent cavity nester populations in the GFMA, and 100 percent cavity nester populations in the RR areas. By providing two snags per acre in the GFMA land use allocation, it would reach the 40 percent level, and by providing five snags per acre in the RR allocations, this would meet the 100 percent level.

Over the next four years, approximately 2,000 trees would be treated in the GFMA, and approximately 2,000 to 5,000 trees would be treated in the RR. Predesignated live trees would become snags by using either explosives to remove the tops of trees, cutting the tops of some trees, or inoculation of trees with a native fungus (inducing a rot into the tree).

2.1.5 Mitigation Measures

Surveys for the 32 species listed in the Schedule Change EA will begin if technical feasibility problems can be solved. If it is determined by species experts that survey feasibility issues have been resolved throughout the suspected range of any of the 32 species, and if a letter of direction is received prior to issuance of a Decision Record, surveys and appropriate

management actions would be implemented.

2.2 Alternative II - No Action

2.2.1 Timber Harvest Activity in the Matrix

No timber harvest would occur within the Lost Creek Analysis Area at this time. Meeting the District's decadal PSQ volume commitment would have to be accomplished from other areas. There would be no increase in the productivity of GFMA lands by thinning overstocked stands.

2.2.2 Density Management Within RR Area

No management activities would be conducted in the RR to increase the stand complexity.

2.2.3 Roads

The Proposed Action would improve 3.79 miles of road, and decommission 1.93 miles of existing road. Under this alternative, improvements and decommissioning would not occur.

2.2.4 Restoration Projects

- **Roads**

Under this alternative, 3.77 miles of decommissioning and realignment of

Road No. 20-1-14.1 would not occur.

Snag creation

- **Snag Creation**

No snag creation would occur to meet 40 percent cavity nester population in the GFMA, and 100 percent cavity nester population in the RR.

2.3 Alternative III

(Refer to **Appendix A** for Project Design Features, **Appendix B** for Harvest Area Details, and **Appendix C** for Road Construction and Closure Summary) This alternative was developed for the following reasons:

- To reduce the amount of road construction and stream crossing needed to proposed Harvest Areas 7 and 14.
- To eliminate harvesting in the RR.
- To defer harvesting in areas with less than six acres (regeneration harvest), or 16 acres (thinning) that would require road construction to access the area.

2.3.1 Timber Harvest Activity in the Matrix

Timber harvesting is the same as Alternative 1 except for the following changes:

- The northeast portion of proposed Harvest Area 12, near stream J, would be deferred from harvesting until the adjacent stand is harvested, in order to build less road. Approximately 0.4 miles of road would have to be constructed to access 16 acres. By not harvesting this portion of proposed Harvest Area 12, concerns about the construction of roads to access small areas would be addressed. Proposed Harvest area 12 would have 16 acres less under this alternative. (Spur 3: 2,000 feet would not be constructed)
- Harvesting in proposed Harvest Area 5E would be deferred under this alternative.
- Harvesting in proposed Harvest Area 15 would be included in this alternative. Proposed Harvest Area 15 was not considered in the Proposed Action because the

area is accessible only by helicopter. This alternative would use helicopters for logging proposed Harvest Areas 7, 14 and 15.

2.3.2 Density Management Within RR Area

No density management would occur within the RR.

The table below summarizes the type of harvest, affected Land Use Allocation, and affected acres for Alternative III:

TYPE HARVEST	LAND USE ALLOCATION	ACRES	Regen Harvest Acres (Skyline)	Regen Harvest Acres (Grnd)	Regen Harvest Acres (Heli)	CT Harvest Acres (Heli / Skyline)	CT Harvest Acres (Grnd)	DMT Harvest Acres (Skyline)	DMT Harvest Acres (Grnd)	Total Volume (MBF)
Regeneration	GFMA	160	31	88	41					5600
Commercial Thinning	GFMA	644				151 / 266	227			5264
Density Management	Riparian Reserve	0								0

TOTAL	804	TOTAL	10,864
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Regen - Regeneration Harvest
CT - Commercial Thinnings

DMT - Density Management Thinning

Grnd - Ground based yarding
MBF - Thousand Board
Feet
Heli - Helicopter yarding

2.3.3 Roads

Helicopter logging would occur in proposed Harvest Areas 7, 14, and 15. Proposed Harvest Area 7 would use helicopter logging in areas that could not be accessed from the roads that would be constructed on the ridge tops. Helicopter logging is proposed in Harvest Area 7, so that 2.2 miles of road would not need to be constructed, and three stream crossings and one wet area crossing would not occur. Under this alternative, 0.6 miles of road would be constructed to access proposed Harvest Area 7 with no stream crossings.

Helicopter logging is suggested for proposed Harvest Area 14 (adjacent to Area 7). This would mean that 0.74 miles of road would not have to be constructed, one landing in a RR would be eliminated, and yarding through two RR would be eliminated.

In Proposed Harvest Area 8, the cat road off of Road No. 20-1-21.5 would not be improved as in Alternative 1. The road would still be decommissioned.

Roads, within and adjacent to proposed Harvest Areas, were

selected to be decommissioned based the following criteria:

- Future use within the next 10-15 years.
- Whether the proposed Harvest Area would be within 0.25 miles of an existing road, if the selected road was decommissioned.
- High risk to resources, water quality, and unstable locations.

If roads were not going to be needed within the next 10-15 years for forest management purposes, they were considered for decommissioning. If roads were in regeneration areas, and another existing road was within 0.25 miles, they were considered for full decommissioning.

Roads that are not expected to be needed in the future were considered for full decommissioning. If a road may be needed in the future, especially in potential thinning areas, the road was considered for decommissioning.

Planned road decommissioning would be completed by applying BMPs and design features as listed in Appendix A, and upon

concurrence from private landowners who may have current rights or future needs of roads within a Reciprocal Right-of-Way Agreement area.

Below is a summary of road decommissioning, road improvement, and construction for Alternative III:

An estimated 3.66 miles of dirt road have been proposed for construction. An estimated 2.58 miles of dirt road would be decommissioned, and 1.08 miles of dirt road would be fully decommissioned. An estimated 0.04 miles of the newly constructed rock road would remain after harvest. An estimated 3 miles of improvement are proposed. An estimated 0.78 miles of existing road that is to be

improved would be decommissioned after harvesting. An estimated 0.36 miles of existing road that is to be improved would be fully decommissioned after harvesting. An estimated 4.09 miles of existing road would be decommissioned.

2.3.4 Restoration Projects

The restoration projects described in the Proposed Action would remain the same with the exception that Road No. 20-1-21.5 (0.32 miles) in proposed Harvest Area 8 would be fully decommissioned.

Dirt road Constr. (Miles)	Dirt road Decom. (Miles)	Dirt road Fully Decom. (Miles)	Rock road Constr. (Miles)	Road Improve (Miles)	Road Improve and Decom. (Miles)	Road improve and Fully Decom. (Miles)	Existing road Decom. (Miles)	Net Increase Roads (Miles)
3.66	2.58	1.08	0.04	2.99	0.78	0.36	4.09	-5.19

Decom. - Decommission; Roads to be blocked and treated as necessary to restore hydrologic functions after completion of timber sale contract.

Full Decom. - Full Decommission; Roads to be decommissioned, subsoiled, and planted after completion of timber sale contract.

* - Road improvement for the road in Area 10 would have a failing culvert that is under 30 feet of fill replaced, and another log culvert on this road would be replaced, along with five additional cross drain culverts installed.

2.3.5 Mitigation Measures

Surveys for the 32 species listed in the Schedule Change EA will begin if technical feasibility problems can be solved. If it is determined by

species experts that survey feasibility issues have been resolved throughout the suspected range of any of the 32 species, and if a letter of direction is received prior to issuance of a Decision Record,

surveys and appropriate management actions would be implemented.

2.4 *Alternatives Eliminated From Detail Study*

An alternative was considered that would have included an estimated 40 more acres of regeneration and 29 more acres of thinning than the proposed action. Some regeneration harvest areas, or portions of harvest areas initially proposed, were eliminated for a variety of reasons. In some cases, extensive stream dissection rendered proposed Harvest Areas too small to be practical, or made logging systems

difficult to execute.

Proposed Harvest Area 1 was dropped due to a combination of low site quality (reforestation limitations) and stability risks associated with yarding and roading. Once RR were identified in the field, proposed Harvest Area 3 was less than five acres. To access the five acres, a road would have to be constructed. Therefore, the harvest area was deferred from harvest. A small portion of proposed Harvest Area 4 was dropped because it necessitated crossing a fish-bearing stream, creating unacceptable impacts to the RR.

2.5 *Comparison of Alternatives*

ELEMENTS	ALTERNATIVE I PROPOSED ACTION	ALTERNATIVE II NO ACTION	ALTERNATIVE III
Regeneration Harvest Acres	132	None	160
Commercial Thinning Acres	690	None	644
RR Density Management Acres	70	None	0
TOTAL ACRES HARVESTED	892	None	804
Miles of new road construction	6.38	None	3.70
Net increase roads (miles)	-5.66	None	-5.19
Acres logged by helicopter	0	None	192
Acres logged by ground based equipment	351	None	315
Acres logged by cable	541	None	297

3.0 AFFECTED ENVIRONMENTS

This section will describe key components of the existing environment. The plants and animals do not differ significantly from those discussed in Chapter 3 RMP, 1994.

3.1 Vegetation

Douglas-fir and western hemlock are the dominant forest trees in the project area. The elevations for the proposed Lost Creek harvest areas are 800 feet to 3,000 feet, near the summit of Castle Rock. Most of the areas selected for this review are second growth conifer stands that range in ages between 40-80 years, with some remnant older trees up to 120 years in proposed Harvest Areas 2B and 14. These mid-aged stands have a forest structure classified as "stem exclusion." Stem exclusion is characterized by high numbers of trees per acre with little or no understory trees or vegetation. Early logging usually left large down logs on the site because they were considered nonmerchantable due to utilization standards at the time. Currently, these old logs are functioning as advanced decay structure.

Associated conifer species are western red cedar, incense cedar, grand fir, and Pacific yew. The common hardwoods are red alder, bigleaf maple, black cottonwood, Pacific dogwood, Pacific madrone, chinquapin, bitter cherry, and willow. Shrubs in the region may

include associations of vine maple, rhododendron, California hazel, ocean spray, red huckleberry, and poison oak. Frequently occurring vascular plants include salal, swordfern, vanilla leaf, Oregon grape, whipple vine, oxalis, and redwood violet.

Stands proposed for treatment have all had some level of harvest in the past. That level of harvest may have been clear cutting, selective cutting, or salvage harvesting. Natural regeneration, from seed trees left on-site or nearby stands, initiated new stands with uneven or patchy stocking, and a range of tree birth dates. Subsequent management practices such as precommercial and commercial thinning have attempted to develop uniform stands to full stocking levels.

The RR areas normally have an overstory of conifers with Douglas-fir as the principal species. Some areas along the creeks may have an overstory of red alder. This is usually a sign of recent past disturbance and relatively early stand development. These alder stands lack the conifers which will provide a future canopy of high shade, nutrient rich detritus, and large woody material for stream habitat structure. A management goal for some selected RR areas is to restore conifers in the understory; to provide large conifers as the short-lived hardwoods recede over time.

3.2 *Wildlife*

Stands of these types are used by approximately 57 species of wildlife for the primary purpose of feeding and/or breeding. An additional 72 wildlife species are known to use stands of this type secondarily for feeding and/or breeding. The species composition includes large mammals such as black bears, deer, elk, bobcats, and mountain lions. Smaller mammal species include bats, shrews, moles, weasels, squirrels, chipmunks, ground squirrels, porcupines, and mountain beaver. Bird species found in habitats such as these include: Cooper's and sharp-shinned hawks, grouse, owls, and many species of song birds. Several species of amphibians and reptiles use these types of forest stands.

There are few snags in any of the project areas. Although a considerable amount of CWD in classes 3, 4, and 5 is present, most of the existing snags and down logs do not meet the Eugene District ROD/RMP requirements because of small size or advance decomposition class.

There are special habitats present within or adjacent to several of the project areas. These areas are unique to the watershed because of their relative scarcity and the features they provide for unique species of wildlife including: western big-eared bats, lizards, sharp-tailed snakes, and pocket gophers. These areas have been withdrawn from harvest.

Approximately 2,369 acres of 80+ year-old forest occur on BLM lands in the Lost Creek watershed. Most of these acres (approx. 1,529 acres) are on the eastern and southeastern edge of the watershed in three sub-watersheds. Seventy-eight percent of 80+ forests (approx. 2,505 of 3,036 acres) lands in this watershed occur on the eastern portion, as well as 99 percent of all of the 200+ year-old forests.

As these forest stands are adjacent to U.S. Forest Service older forest, the potential for wildlife species related to Late-Successional forests to occur in this portion of the watershed are higher than the rest of the watershed.

The Lost Creek watershed has a portion of a CHU for the NSO located within its boundaries. Critical Habitat Units were designated by the U.S. Fish & Wildlife Service (USFWS) as an interim measure to provide habitat for NSOs until a recovery plan or management plan addressing NSO habitat is adopted. This CHU extends from T. 20 S., R. 01 W., Section 5 as the northwest corner of the Proposed Harvest Area, to the southeast onto U.S. Forest Service land. The CHU has approximately 78,423 acres of BLM and Forest Service land encompassing several watersheds. There are approximately 10,060 acres (13 percent) of BLM land within the CHU, and of those acres, 10,034 acres are forested lands. Of the forested acres, there are approximately 4,880 acres (48.5 percent) that are considered suitable habitat for NSOs.

Approximately 2,225 acres of habitat are considered suitable for nesting, and 2,655 acres are considered suitable for roosting and foraging. All of these acres are considered dispersal habitat. Currently, there are eight known active NSO sites located in the Lost Creek watershed.

Other species of wildlife considered as special status species by the BLM are not known to occur within the watershed. These species include peregrine falcon, bald and golden eagle, northern goshawk, pine marten, and fisher.

3.3 Survey and Manage

The NFP contains guidelines to manage old-growth related species and produce a sustainable level of timber. It provides standards and guidelines to provide benefits to amphibians, mammals, bryophytes, mollusks, vascular plants, fungi, lichens, and arthropods that are assumed to be old-growth associated species. The standards and guidelines contain four components, plus protection buffer species, each with different priorities and species to which they apply (see Table C-3 in the NFP). Components 1, 2, and Protection buffer lists apply to the Eugene District. Surveys for Component 3 and 4 species are being done at the regional level and do not presently apply at the District level.

The Eugene District is required to manage known sites of the species on the Component 1 list. When one of these species is found, the site is to be managed for the benefit of that species. Component 2 species require surveys prior to ground disturbing activities and management of known sites. Protection buffer species are surveyed for prior to ground disturbing activities. A pre-field review was completed as required, followed by surveys where needed, based on species range and habitat. Surveys for species covered by the Schedule Change EA were not conducted, however, some species were found incidentally during other surveys. The required surveys for a Survey and Manage species have been completed.

The table below shows the results from the surveys:

SPECIES	OCCURRENCES
Component 2 bryophytes & lichens	0
<i>Ulota megalospora</i> (moss, Protection Buffer species)	found in 7 proposed Harvest Areas
<i>Neournula pouchetii</i> (fungi)	1 site
<i>Sarcosoma mexicana</i> (fungi, Protection Buffer species)	11 sites
Component 1 fungi	
<i>Helvella compressa</i>	37 sites
<i>Helvella elastica</i>	3 sites
<i>Sarcosoma latahense</i>	3 sites
Component 2 mollusks	
Blue-gray tail dropper slug	150 sites
Megomphix snail	48 sites
Papillose tail-dropper slug	21 sites

3.3.1 *Ulota megalospora*

Ulota megalospora was found in 61 percent of the proposed Harvest Areas surveyed and is well-distributed across the watershed. All of the occupied proposed Harvest Areas had large areas occupied, indicating that the species is abundant in the watershed.

3.3.2. *Neournula pouchetii*

Neournula pouchetii was found in 4 percent of proposed Harvest Areas surveyed. The species is uncommon in this watershed.

3.3.3 *Sarcosoma mexicana*

Sarcosoma mexicana was found in 23 percent of the proposed Harvest Areas surveyed. This species is uncommon in this watershed.

3.3.4 *Helvella Compressa*

Helvella compressa was found in 60 percent of the proposed Harvest Areas surveyed. This species occurs primarily in riparian areas and areas disturbed in the past.

3.3.5 *Helvella elastica*

Helvella elastica was found in 13 percent of the proposed Harvest Areas surveyed. This species is restricted to two proposed Harvest

Areas of the sale, occurring in areas disturbed in the past.

3.3.6 *Sarcosoma latahense*

Sarcosoma latahense was found in 13 percent of the proposed Harvest Areas surveyed. This species is restricted to two proposed Harvest Areas of the sale, occurring in areas disturbed in the past.

3.3.7 Blue-gray tail-dropper

The Blue-gray Tail-dropper was detected in 100 percent of the proposed Harvest Areas surveyed and is well-distributed across the watershed. Fifty-eight percent of the occupied proposed Harvest Areas have high numbers of sites, indicating they are abundant in the watershed.

3.3.8 *Megomphix* snail

The *Megomphix* snail was detected in 75 percent of the proposed Harvest Areas surveyed and is fairly well-distributed across the watershed. Fifty-six percent of the occupied proposed Harvest Areas have fairly moderate numbers of sites, and 22 percent have high numbers, indicating they are moderately common in the watershed.

3.3.9 Papillose tail-dropper

The Papillose tail-dropper was detected in 67 percent of the

proposed Harvest Areas surveyed and is fairly well-distributed across the watershed.

Thirty-eight percent of the occupied proposed Harvest Areas have moderate numbers or better, and 62 percent have low numbers of sites, indicating that they could benefit from a conservative management approach.

3.3.10 Red tree vole

The protocol, as established in BLM Instruction Memorandum OR-97-009, does not require surveying for red tree voles where a minimum of 40 percent of the federal land in the fifth field watershed is forested and (a) has approximately 60 percent crown closure or greater, and (b) has an average conifer tree diameter at breast height of approximately 10 inches or greater, and (c) this closure and diameter can be maintained through the end of the decade. An estimated 60 percent of the Lost Creek Watershed is considered red tree vole habitat. After harvest, 59 percent of the Lost Creek Watershed is considered red tree vole habitat. Therefore, surveys were not required.

3.4 Soils

Soils in the Lost Creek Watershed formed in volcanoclastic rocks, basaltic lava flows, and tuffaceous rocks with small areas of alluvial soils present in the valley and along some of the major

tributaries. In addition, ancient landslide debris flow deposits are present in the Wagner, Middle, Osage, and Guiley creek subbasins.

Areas suitable for harvest fall into the High or Moderate soil resiliency categories identified in the Lost Creek watershed analysis. The analysis found 58 percent of the area as having soils with high productivity and high resiliency to surface disturbance. These soils are generally deep and well-drained, with loam, clay loam, or silty clay loam textures, and high levels of organic matter, nutrients, and plant-available water. They occupy gentle to moderate topography and some steep slopes. Thirty-five percent of the analysis area has soils with moderate soil productivity and resiliency. These soils are moderately deep and may have coarse fragments throughout the soil profile. Additional mitigation measures are utilized to reduce surface disturbance on these soils.

Less than 7 percent of the analysis area was classified as having soils with low productivity and resiliency. These soils are generally shallow, have a high coarse fragment content, and are often associated with rock outcrops and cliffs. These soils are classified as Fragile and, therefore, not suitable for harvest activities.

3.5 Water Quality

The Lost Creek watershed is approximately 55 square miles in size.

Lost Creek is a 6th order stream, flowing at predominantly a low gradient (<3 percent). Lost Creek and its tributaries discharge to the Middle Fork of the Willamette River about 3 miles downstream from Dexter Reservoir. Natural stream flow within the watershed reflects the seasonal precipitation pattern, with low flows occurring in the summer and highest flows occurring in the winter. Monthly minimum and maximum stream flows for the year on Lost Creek are estimated at five cfs and 826 cfs, respectively. The eastern portion of the watershed is dominated by Lost Creek and the western portion has several large, named tributaries. From the north to south these tributaries are: Anthony, Middle, Carr, Osage, East Osage, and Guiley creeks. Stream densities by subbasin range from 2.7 to 6.7 miles of stream per square mile. Streamflow response to precipitation in forested watersheds involves a variety of processes affected by climatological conditions, topography, soils, vegetation, and land uses. Annual precipitation within the watershed ranges from 48 to 66 inches, falling mostly as rain. Although the majority of precipitation falls as rain, the critical hydrologic events, from an erosion standpoint, are dominated by snow. Roughly 25 percent of the land in the Lost Creek watershed is located in the transient snow zone between 2,130-2,810 feet in elevation. Shallow snowpacks in this zone may yield meltwater quickly during warm or rainy periods, which can result in higher rates of water input to soil than would

commonly result from rainfall alone.

Closed or dense canopies may intercept some of the direct precipitation by absorption and protect an accumulated snowpack from rapid melting. Of the BLM lands in the transient snow zone, 94 percent are hydrologically mature with a dense canopy closure; about 6 percent have intermediate hydrologic maturity with a less than dense crown closure but where interception would occur; and 0.1 percent are considered to be hydrologically immature where canopy interception of precipitation would not occur. Unfortunately, there is incomplete data on the condition of forest stands on private land, which also intercept precipitation and influence the amount of runoff in the basin.

Identified beneficial uses of water within the watershed are: Water Supply, Irrigation and Livestock Watering, Anadromous Fish Passage, Salmonid Fish Rearing and Spawning, Resident Fish and Aquatic Life, Wildlife and Hunting, Fishing, Water Contact Recreation, and Aesthetic Quality. According to records in the Lost Creek Watershed Analysis (March 1997), there are four water rights for domestic water supply, four permits for industrial water supply, 51 permits for irrigation, four permits for agriculture and livestock watering, and two permits for fish and wildlife in the watershed.

Water quality parameters such as dissolved oxygen, pH, nutrients, and bacteria are not expected to be impacted under any of the alternatives.

Turbidity and sedimentation are discussed under Issue #2, and water temperature is discussed under Issue #4.

3.6 Fisheries

The Lost Creek watershed supports both resident and anadromous fish. Anadromous fish (spring chinook salmon and winter steelhead) range from the mouth of Lost Creek to the confluence with Osage Creek (about 9.4 miles). Salmon use only main stream Lost Creek and possibly lower Anthony Creek where gradients are <3 percent. Steelhead may also use the lower reaches of Wagner, Anthony, Middle, Carr, Osage, and Guiley creeks. Spring chinook and winter steelhead have recently been proposed as threatened species under the Endangered Species Act. Salmon usually spawn in September when access to spawning grounds is sometimes blocked by low, even underground flows at the mouth of Lost Creek; therefore, there is no spawning of this species in this watershed.

Resident fish species include cutthroat trout, rainbow trout, speckled dace, western brook lamprey, and various sculpin species. Cutthroat trout and sculpins are widely distributed throughout the basin and can be found in most streams with gradients <17 percent. Rainbow/steelhead trout are restricted to streams having gradients <7 percent. Dace and lamprey may use the low gradient channels.

Spawning and rearing habitat in the Lost Creek watershed is limited due to problems associated with high water temperature, seasonal low water levels, and lack of habitat complexity. Many of these problems can be attributed to low amounts of CWD in fish-bearing streams, and limited recruitment potential from adjacent riparian areas.

There are approximately 3.8 miles of fish-bearing streams in or adjacent to seven of the proposed Harvest Areas. Middle Creek (proposed Harvest Area 4) has potential habitat for both rainbow/steelhead and cutthroat trout. The other fish-bearing streams are suitable for cutthroat. There are no salmon streams adjacent top.

3.7 Rural Interface

Proposed Harvest Areas 2B and 4A occur on land designated as rural interface. Proposed Harvest Area 2B is adjacent to two private landowners. Road No. 19-1-33.1 runs through part of proposed Harvest Area 2B and is adjacent to other parts of the proposed Harvest Area. This road is used by a variety of users from forest workers to recreationists. Part of this proposed Harvest Area can be seen from the road and an adjacent landowner's residence. Proposed Harvest Area 4A is adjacent to five landowners and is 16 acres. It is also adjacent to Middle Creek that receives some dispersed recreational use. Road No. 19-1-33 is north of proposed Harvest Area 4A. This road ends approximately 2 miles from the

proposed Harvest Area so it is not a main travel route like Road No. 19-1-33.1. A portion of this proposed Harvest Area is probably seen from the road and some landowners' property. Other landowners have trees on their property that partially block their view of proposed Harvest Area 4A.

3.8 Transportation System

A system of arterial, collector, and local roads allows travel to various parts of the watershed. Arterial and collector roads form the backbone of the transportation system. These roads are primarily accessed by Federal, State, local government, and private roads. BLM roads are not public roads and are best described as "private government roads." A factor in this determination is that the BLM is not a public road authority and cannot dedicate public roads. BLM roads do not fit the criteria for public roads as established by the Secretary of Transportation. Rather, BLM policy designates that BLM roads are available for public use. The United States, as proprietor of the public lands, may construct roads and prescribe the type, manner, and extent of use they receive. At present, the open road density on BLM managed lands within the analysis area is approximately 3.9 mi./sq. mi.

The transportation network in the Lost Creek Watershed is comprised of two major road systems: Eagles Rest-Lost Creek road loop system that is primarily controlled by the BLM, and the Anthony

Creek-Guiley Creek road system that is primarily controlled by the Giustina Companies. These two road systems access both Federal and private lands and, because of BLM's checkerboard ownership, the BLM has entered into Reciprocal Rights-of-Way agreements with Giustina Land and Timber, Giustina Resources, and Willamette Industries. These Reciprocal Rights-of-Way agreements grant rights to each party to construct new roads across each other's lands for the purpose of access. In addition, each party may use roads controlled by either party for management activities on their intermingled lands, thereby eliminating the need for duplicate road systems.

In the Lost Creek Watershed Analysis Area, there are approximately 216 miles of road. It should be noted that 40 percent of the roads within the analysis area are located on BLM land. Of the total land area in this analysis area, approximately 36 percent is controlled by BLM, 47 percent is controlled by large timber companies under Reciprocal Rights-of-Way agreements, and 17 percent is controlled by other landowners.

The majority of the roads in the analysis area are crushed aggregate surfaced timber haul routes. The road grades change throughout the system, ranging from 0 to 16 percent. Many of the unsurfaced or old roads are in some stage of hydrologic recovery. Most of the older natural surfaced roads are not contributing sediment to stream channels.

4.0 ENVIRONMENTAL CONSEQUENCES

This incorporates the analysis of cumulative effects in the *USDA, Forest Service and the USDI, Bureau of Land Management Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl*, February 1994, (Chapters 3 & 4) and in the *Eugene District Proposed RMP/EIS*, November, 1994 (Chapter 4). These documents analyze most cumulative effects of timber harvest and other related management activities. None of the alternatives in this Proposed Action would have cumulative effects on resources beyond those effects analyzed in the above documents. The following analysis has a cumulative effects section that supplements those analyzed in the above documents, and provides site-specific information and analysis particular to the alternatives considered here. Aquatic Conservation Objectives are listed in Appendix E .

4.1 **Alternative 1 - Proposed Action**

4.1.1 **Issue #1 - What are the effects of harvesting activities and road management on the timing and magnitude of Peak Flow?**

Peak flow is defined as the highest instantaneous rate of streamflow

attributable to a particular rainfall or snowmelt event. This specifically concerns the following actions:

- Timber harvesting on proposed Harvest Areas 7, 8, 9, 10, and 12 within the transient snow zone.
- Planned road construction and road restoration work in the project area.

Direct and Indirect Effects

Direct effects include timber harvesting, road construction, and road decommissioning, but the impact of these activities on the size of peak flows is difficult to predict and measure. The delivery rate of water to the forest floor and streams is influenced by changes in interception, fog drip, transpiration, snow accumulation, and snow melt resulting from canopy alterations and roads.

Most research on hydrologic response to timber harvesting has been conducted in clear cuts where little or no streamside timber was left behind, and midslope roads and compacted skid roads delivered run-off directly into adjacent streams. This research has indicated that, although smaller peak flows may have been increased by clear cut harvesting, major run-off events were impacted very little (Harr 1976). The effect of regeneration harvesting or commercial thinning conducted under the standards of the NFP on stream flows has not yet been extensively studied. Current standard practices include establishing RR adjacent to all surface water features, constructing

roads with an adequate number of cross drains, and decommissioning roads not needed after harvesting activities. With these standard practices in place today, any effects to stream flow from harvesting or road construction are likely to be negligible and short-lived.

Ken Carlson, Beak Consultants, calculated the peak rain-on-snow zone for the McKenzie Watershed using local data. This rain-on-snow zone is estimated to be from 2130 to 2810 feet in elevation. For the Lost Creek Watershed, this elevation band fits the zone where relatively shallow snowpacks have been found to accumulate in the watershed. These shallow snowpacks can be prone to rapid melting during winter rain storms, resulting in higher rates of water input to soil than would commonly result from rainfall alone.

Although higher rates of water input to soil occur after clear cut harvesting, current research has not shown conclusively that removal of the forest canopy within the transient snow zone increases the rate of snowmelt during rainfall sufficiently to increase peak streamflows (Harr 1986). Timber harvesting may result in more saturated soil conditions in the proposed Harvest Area, but there is no data to indicate that the run-off is reaching the stream system, particularly with riparian buffers established that are consistent with NFP guidance.

Under this alternative, there would be no timber harvesting within 80 feet of

stream channels; commercial thinning in patches of the RR would be limited to areas outside of this 80-foot “no cut” zone. The integrity of the streambanks would be maintained, and no changes in the timing and magnitude of stream flows would be anticipated.

Under this alternative, 0.03 percent of the project area (31 acres of the total 892 acres) would be regeneration harvested within the transient snow zone. Commercial thinning is not expected to alter the forest canopy to the extent that it would affect the amount of water input to soil, or the amount of run-off.

Roads are more permanent than canopy openings, and an increase in peak flows from these severely compacted surfaces can be significant if there are no cross drains to intercept run-off before it reaches the stream system. Utilizing temporary roads for harvesting activities, followed by decommissioning, would protect streams from long-term road related run-off. Fully decommissioning roads no longer needed, and adding cross drains on existing permanent roads where needed, would play an important role in contributing to a reduction of road related run-off in the watershed. Soil compaction from ground based harvesting would be mitigated within the proposed Harvest Areas, and tilling compacted skid roads would prevent overland flow during larger run-off events.

Therefore, the combination of proposed road construction, repair,

decommissioning, and Standards & Guidelines for timber harvesting is expected to result in an overall reduction of run-off reaching the stream system during winter storm events. As a result, the timing and magnitude of in-stream flows would be maintained or restored to a more natural condition, and the intent of ACS Objective 6 would be met.

Indirect effects include the growth of young forests in the areas regeneration harvested. New tree growth would result in gradual canopy closure, and any changes in hydrologic processes as a result of timber harvesting, would gradually diminish over time.

Cumulative Effects

As a result of timber harvesting, the percentage of BLM lands in the Lost Creek Watershed considered to be hydrologically immature in the transient snow zone would increase from 0.1 to 0.8 percent. Since RR would be established adjacent to all surface water features (springs, wetlands, and streams), any increase in water input to soil (particularly in the regeneration proposed Harvest Areas) may be intercepted by the intact vegetation remaining in the wide RR. By reducing the road density and improving drainage conditions of the permanent road system within the project area, the amount of road related run-off currently entering the stream system would be reduced, resulting in an improved condition of the watershed.

4.1.2 Issue #2 - *What are the effects of harvesting activities and road management activities on erosion and sediment delivery to water bodies?* This specifically concerns the following actions:

- Construction of temporary stream crossings in proposed Harvest Areas No. 7 and 8.
- Replacement of failing log culvert in existing stream crossing in proposed Harvest Area 10 with a corrugated metal pipe (CMP) sized to a theoretical 100-year storm event.
- Restoration of Stream #9 in proposed Harvest Area 10.
- Decommissioning roads in proposed Harvest Areas 2, 9, 10, and 11.
- Road restoration projects including repair of flood damaged Road No. 20-1-14.1.
- Road construction (with no stream crossings) and/or yarding activities in the RR areas in proposed Harvest Areas 2, 4, 5, 7, 8, 10, 11, 12, and 14.

4.1.2.1 Hydrology

Direct and Indirect Effects

Direct effects include the temporary addition of sediment to streams during the construction, improvement, or removal (decommissioning) of stream crossings. The impacts to the

stream at individual crossings are expected to be short-term, as the first fall rains following the activity would move the sediment downstream. Replacement of failing or eroding stream crossing structures would improve existing conditions and reduce the amount of sediment entering the stream at the crossing (meets ACS Objectives 4, 5). In one case, replacement of a failing log culvert near proposed Harvest Area 10 would reduce the potential for possible catastrophic downstream impacts to aquatic resources and associated beneficial uses as identified by the Oregon Department of Environmental Quality. Sizing permanent crossings to accommodate a 100-year storm event would maintain the natural sediment regime and reduce the potential for plugging by debris (meets ACS Objective 5). By using washed gravel in the construction of temporary stream crossings, the introduction of fine sediment into the water would be minimized when the crossing is removed after harvest activities (meets ACS Objective 4). Minor excavation to restore a natural stream channel, disturbed by the failure of an old skid road near proposed Harvest Area 10, would return that stream to its natural drainage and minimize future sediment recruitment (and road maintenance) from ditch erosion (meets ACS Objectives 3, 5).

Indirect effects include impacts to the channel farther downstream as a

result of movement of the sediment generated during construction or removal of a stream crossing. Again, this impact is anticipated to be short-term as the fall and winter storms would disperse the sediment through the system downstream. The placement of relief drainage features to improve existing roads would have no direct effects to channels, but would have the indirect effect of reducing the amount of sediment from these roads delivered to streams. Actions to stabilize or decommission actively failing road segments would have the indirect effect of decreasing the potential for sediment delivery as a result of a road-related slope failure generated on these roads.

There are no roads proposed for construction, reconstruction, decommissioning, or restoration that cross fish-bearing streams. Therefore, no direct impacts to fish are expected from these activities.

No direct or indirect effects are anticipated from permanent or new temporary road construction that does not intersect a stream. No direct or indirect effects are expected from harvesting activities within the RR, since no cutting or yarding would take place within 80 feet of a stream channel, or on any steep and potentially unstable slopes.

Cumulative Effects

ACS Objective 5 calls for the

maintenance and restoration of the sediment regime under which aquatic ecosystems evolved. The Lost Creek Watershed analysis determined roads have increased the potential for sediment delivery to streams above natural background levels in several subbasins, including Anthony, Middle, Osage, and Guiley creeks. Mass wasting is a natural process within the watershed, generally associated with the very steep headwalls, channel sidewalls, and inner gorges of some of the streams in the basin. The watershed analysis and field reconnaissance indicates road construction on steep slopes has increased the rate of landslides and debris torrents, particularly in Anthony, Wagner, and Osage creeks.

Recommendations in the watershed analysis to reduce sediment delivery from roads include:
decommissioning road segments that intersect streams, stabilization or decommissioning failing roads, replacement of eroding culverts, and the placement of additional relief drainage on permanent roads. The Proposed Action includes elements of all these recommendations such as decommissioning existing roads, in particular unstable roads; improvement of relief drainage on existing roads; replacement of failing crossings; as well as no permanent new stream crossings.

Use of temporary stream crossings

would meet ACS Objectives 3 and 5 by restoring the stream bank and channel bottom to a natural configuration and maintaining the natural sediment regime. The cumulative effect from the Proposed Action would be to improve the sediment regime and water quality in the subbasins mentioned above, thereby meeting the intent of ACS Objectives 4 and 5.

4.1.2.2 Fisheries

Direct and Indirect Effects

Fourteen stream crossing sites would be affected by this action (proposed Harvest Areas No. 7, 8, 10). After the roads have been decommissioned, twelve of these stream crossings would be removed, and the stream would be allowed to flow freely. Although no crossings would be on fish-bearing streams, downstream fish could be affected by sediment generated by the construction/removal of culverts (see 4.1.2.1). The nearest fish-bearing streams are between 500 feet (proposed Harvest Areas 8 and 10) and one mile (Proposed Harvest Area #7) away from these locations. Fish at these distances should not suffer any negative effects of the actions, since they would be conducted during the summer, and are not located in areas with high potential for landslides or debris torrents. The Proposed Action would not prevent the attainment of ACS Objective #4.

Cumulative Effects

Installing or removing culverts during the summer should lessen any cumulative effects of stream crossing activities on fish-bearing streams.

4.1.3 Issue #3 - *What are the effects of timber and road management activities in the Riparian Reserves?*

Timber management within RR would be density manipulation of the standing trees. Subsequent management activities would be snag creation and additional down trees for large woody debris structure. Timber management within RR concern the following proposed Harvest Areas: 2A, 4, 5, 7, 8, 10, 11, and 12.

4.1.3.1 Hydrology

Direct and Indirect Effects

No direct or indirect effects on water temperature are expected from thinning within the RR since no harvesting would take place within 80 feet of a stream channel. Road construction would not open the canopy to the extent that it would have any effect on existing water temperature. Therefore, water quality would be maintained and ACS objective 4 would be met.

Cumulative Effects

No cumulative effects to water temperature are anticipated because

thinning in the RR would be no closer than 80 feet of stream channels. Although the canopy would be opened so that temporary stream crossings could be constructed, these openings would grow together within a short time frame and have no cumulative effect.

4.1.3.2 Soils

Direct and Indirect Effects

Direct effects of yarding activities in the RR would be soil compaction and displacement within the yarding skid trails. A minimum of lead-end suspension is required for cable yarding here, and compacted ground-based yarding trails would be tilled. Therefore, impacts to long-term soil productivity are not anticipated as a result of harvesting activities. New road construction not subsoiled or fully decommissioned would result in the direct effect of loss of productive soils in these areas. This involves approximately 1,200 feet of road surface in proposed Harvest Area 7. The compacted road surface would have the indirect effect of initially slowing growth of the residual trees adjacent to the road. This influence on the residual trees is not anticipated to be long-term.

Cumulative Effects

No cumulative effects on long term soil productivity are anticipated. In the future, final harvest activities in proposed Harvest Area 7 could

include full decommissioning of all or a portion of the road within the RR; this would reclaim some of the productive soil.

4.1.3.3 Wildlife

Direct and Indirect Effects

The Proposed Action would have a direct effect on the resident wildlife because there is an expected removal of approximately 100-130 trees per acre, and a residual density of 80-100 trees per acre. This action would cause a reduction in canopy closure for the next decade in the thinned areas, and could result in some microclimate alteration, or other adverse effects, for species preferring complete canopy closure, or that do not tolerate disturbance.

Additional impacts are associated with the damage to the understory vegetation during the riparian treatment operation. The vegetation provides cover, forage, nesting locations, and other life cycle requirements for several wildlife species. Any such effect would be temporary due to the influence of the residual trees, and the extensive untreated areas; the current stand condition provides relatively poor habitat for riparian-dependent species associated with Late-Successional forests. With the creation of snags and CWD incorporated in this management action, wildlife species that use these habitats would benefit from the

added structure in the ecosystem (ACS objective #9) .

Removal of trees from the canopy would generate a short-term negative impact due to the temporary disturbance upon the remaining trees. Standing trees may receive a minimal amount of crown and stem damage from the activity. Some leave trees may be damaged by strong winds for a few years because of stand instability brought about by their release and the loss of tree to tree support. The windthrown trees left on the forest floor would supply a natural element of new coarse woody material. Individual tree stability would begin to reestablish within the first growing season. The additional growing space for the remaining trees would allow for the expansion of the green crowns, stronger root systems, and accelerated diameter growth. The effects of the density treatments would be somewhat more widespread than the stated boundary. The edge vegetation is expected to have some response to the added light and growing space.

Selected trees remaining after treatment would be a species mix of Douglas-fir and co-dominant western red cedar, western hemlock, and grand fir. This species mix of reserved trees would shift the stand composition away from a Douglas-fir dominated canopy. A portion of these standing trees would be recruited at some time in the future

to be a source of snags and CWD (ACS objective #8). Merchantable material that is not needed to meet RR and ACS goals would be removed at the time of the thinning operations.

Indirect effects associated with the reduction of the number of trees below that of managed stocking levels would be future development of large individual trees with strong limbs and larger green crowns, better developed understory trees, and more vertical structure at the mid-level. Opening the dense high crown would also stimulate the ground level shrubs and plants, and increase the complexity of the community at all levels. Thinning in RR would facilitate the restoration of plant communities with comparable composition and structural diversity, as found in Late-Successional forests. The current stands provide poor habitat conditions for Late-Successional riparian species. Thinning in the RR, and the adjacent upland areas, would increase the complexity and diversity of the region, and contribute to the restoration of a forest landscape with natural connectivity between watersheds (ACS objectives 1, 2, & 8).

Indirect effects to wildlife associated with timber management activities in the RR would be changes in structural diversity in the treated areas. The creation of snags in these treatment areas would provide

habitat for wildlife associated with these components. The increased structural diversity over time would provide improved habitat to species associated with older forests and riparian regions. These treatment areas are assumed to develop and exhibit Late-Successional forest conditions over a period of many decades (ACS objectives 1, 8, & 9).

Indirect effects would occur following the decommissioning or rehabilitation of existing roads within the RR, such as tree crown development and increased annual vegetation. Vegetation responds to these road openings as gaps, and these areas develop into pockets of younger forest, increasing diversity for wildlife species. This development is expected to occur over a 10-20 year period. (ACS objective #9).

Cumulative Effects

As a result of density management in the RR, there would be an increase in the number of BLM RR acres in the Lost Creek Watershed that move toward more complex stand structure within a reduced time period. Snags would be provided for through this project and through natural mortality process. Snags provided through snag creation would be larger than through the natural mortality process. Trees could grow larger by as much as 30 percent over non-thinned stands over a time period of ten years.

Trees that would become future down logs would be larger. By increasing the amount of land with Late-Successional forest structure and habitat, there would be a commensurate increase in the species that are associated with this ecotype. This is expected to improve the condition of the watershed.

No negative cumulative effects are anticipated from this action. Possible detrimental effects considered were: long-term loss of wildlife habitat and impacts on special plant and animal habitats. Continued harvesting activities conducted on private forest lands within the watershed could impact the adjacent BLM RR through increasing the blowdown potential. This would reduce the amount of close canopy in the RR, affecting species needing close canopy. Protection of the entire streamside ecosystem, along the course of any given stream, is directly proportional to that amount of stream crossing BLM lands.

4.1.3.4 Fisheries

Direct and Indirect Effects

No direct effects to fish are expected from the density management thinning in the RR as described in the Proposed Action because no ground based activity would occur within 80 feet of the stream channel.

There are no roads proposed for construction, reconstruction, decommissioning, or restoration that cross fish-bearing streams. Therefore, no direct impacts to fish are expected from these activities.

In-channel CWD is a critical habitat element for salmon and trout. Most of this material comes from the adjacent forest within 100 feet of a stream, so thinning close to 80 feet from the stream channel could have some indirect effect on CWD recruitment into the stream, and thus, affect the quality of fish habitat.

The trees that remain after thinning would have less competition and would be able to grow larger, faster than the untreated portion of the RR and no action alternative. This should have a positive long-term effect on fisheries resources.

Snag creation has potential to reduce the number of trees available for fish habitat. By topping live trees to create snags, they cannot grow to maturity, die, and fall into the stream. The small number of snags created is not expected to be significant and would not prevent the attainment of ACS objectives 3, 8, and 9.

Cumulative Effects

No cumulative effects from thinning or road management in the RR are expected. Most of the potential riparian density management areas

and stream crossing sites are located in the Osage Creek drainage about 2.5 to 3 miles from the confluence with Lost Creek. Steelhead probably would use only the lower half mile of Osage Creek for winter spawning, and would not be affected.

4.1.4 Issue #4 - *What Is the Impact of Harvesting Activities on a NSO Nest Site Adjacent to a Planned Harvest Area?*

Direct and Indirect Effects

Direct effects to a pair of NSOs nesting near a proposed Harvest Area would be the loss of 164 acres of available nesting and roosting habitat within 0.5 miles of the nest site. This habitat would be changed from suitable nesting habitat to dispersal habitat. A core area designated for this pair of NSOs exists approximately 0.75 miles from the proposed Harvest Area. This core area was established with the development of the

NFP, and functions as refugia for Late-Successional forest related species, and a nesting site for NSOs. The pair of owls moved to the current location prior to the establishment of the core area.

Indirect effects to the pair of NSOs would be the preclusion of nesting in the area due to the loss of habitat. The thinning prescription would disturb the ground vegetation and habitat that small mammals depend on, causing a decrease in owl prey in the short term.

This may cause the owl pair to expend additional energy for food resources, diminishing energy needed for nesting and raising young.

Additionally, the thinning area may not be used by the owl pair for foraging because of the lack of canopy closure, inadequate perching sites for hunting, and lack of protection from avian predators. The use of the proposed Harvest Area by owls may resume after 10-15 years, following development of understory vegetation and recovery of the overstory to conditions similar to preharvest conditions.

Cumulative Effects

Cumulative effects to NSOs within the watershed are negligible due to the number of pairs of owls currently occupying the watershed, and the larger number of owl pairs within the adjacent Forest Service lands. While the owl pair would probably not be reproductive, the potential for harvesting activities to displace the existing pair of owls is relatively low. However, if this does occur, the site would still have the potential for occupancy from owls dispersing off adjacent Forest Service lands.

4.1.5 Issue #5 - *What are the impacts of harvesting and road management activities on the Critical Habitat Unit?* Proposed Harvest Areas No. 2, 5, 6-9, and 14 are in the CHU.

Direct and Indirect Effects

Direct effects associated with the impacts of harvesting and road management activities on the CHU and adjacent LSR would be in the form of the degradation of habitat used by NSOs for nesting, roosting, foraging, and dispersal. As each timber sale proposed Harvest Area is harvested, a direct effect to that habitat would occur immediately.

Indirectly, a change in the composition of the current forest conditions within the CHU would occur. Within the CHU, approximately 862 acres of dispersal habitat would be degraded from its existing condition. There would be approximately 93 acres that would change from suitable nesting habitat to functioning only as dispersal habitat.

Cumulative Effects

The impacts associated with this action would last from approximately 10 years, for thinning activities, to 50 years or more for regeneration harvests and road construction. Cumulative effects associated with harvest activities on the CHU are negligible because the RR, other Reserves, adjacent LSR, retention trees, snag creation, and other guidelines adopted through the NFP would provide habitat for owl dispersal and other life history needs.

4.1.6 Issue #6 - *What are the effects of harvesting 80+ year-old stands on the remaining 80+ year-old stand network and*

Late-Successional species?

Direct and Indirect Effects

The Lost Creek Fifth-field Watershed is 34,658 acres with the BLM portion being 12,991 acres of forested lands. Federal forested ownership in the watershed is 13,158 (USFS is 167 acres). For the 15 percent rule outlined in the NFP, 1,981 acres of 80+ years old stands are reserved from harvest. The watershed currently has 2,284 acres in 80+ year-old age class; the difference is 303 acres. The Proposed Action would harvest an estimated 84 acres of the 80+ year-old stands. This would result in less than 1 percent reduction in 80+ stands in the watershed.

Direct effects from harvesting 80+ year-old timber on the remaining 80+ forests within the Lost Creek watershed would be the loss of these older trees, and smaller old forest stand habitats. Approximately 84 acres of this age class is planned for harvest. The distance away from the other older forest stands in the watershed, and the relatively small sizes of the proposed Harvest Areas (40, 30, and 14 acres) isolates these stands. Most of the 80+ stands reserved from harvest under the 15 percent rule are grouped together and are near the older forest on FS lands. These stands serve as a travel and dispersal corridor for Late-Successional forest related wildlife. They have a greater potential to function as interior Late-Successional forests, now and in the future.

The wildlife species that use these particular forest stands would not have these stands for their life history needs for approximately 40 or more years. The selection of large, older trees used by some raptors would be reduced, and the potential for these species to use these stands for nesting would proportionally be reduced. The availability of resources for large down woody debris would be reduced with the reduction of trees in these areas as well. This effect would last for the time it takes to grow additional trees the size of those that are removed, which could be for 100 or more years.

Cumulative Effects

Cumulative effects to the 80+ year-old forest stands in the watershed from the harvesting of 84 acres of 80+ year-old forest would be negligible. The stands that are to be harvested are isolated and small in size, compared to the remaining 80+ year-old forests in the watershed. Excluding these other forests from harvest by incorporating them into the 15 percent guideline for the watershed, would ensure that these forest stands would provide habitat to interior forest related wildlife species, and the integrity of these forest stands would remain and continue to improve.

Additionally, the remaining older forests in the watershed are positioned in such a way as to provide contiguous dispersal and migration corridors into and from the LSR on Forest Service land.

4.1.7 Issue #7 - *What are the effects of Harvesting Activities Adjacent to 200+ year-old Stands?* Specifically proposed Harvest Areas 5E, 12 and 14.

Direct and Indirect Effects

Direct effects to the adjacent 80+ year-old stand from the harvesting of proposed Harvest Areas 5E and 14 are negligible. These older stands would remain intact and protected from harvest. For proposed Harvest Area 14, the 200+ year-old stand has a 180-foot RR buffering it from the harvest action. The RR is estimated to be 90 years old, and would mitigate the impacts associated with the harvest. Proposed Harvest Areas 5E and 5F are adjacent to the old growth stand, which is part of the 15 percent rule. These reserve old growth trees are growing at very wide spacing. These trees exhibit crown development that comes from long periods of open growing conditions and no tree to tree competition. Thinning the adjacent younger stand would result in a small change in the on-site microclimate, and little if any, influences to the reserve stand. These impacts would last approximately five years.

Proposed Harvest Area 12 would be thinned. Thinning the stand would result in a small change in the on-site microclimate of the older stand. These impacts would last approximately five years.

Cumulative Effects

Cumulative effects associated with the harvest of proposed Harvest Areas 5E and 14 to the adjacent older forest stands are negligible. These 80+ forest stands are small in size and very isolated from other forest stands, and the potential to provide interior forest is limited. These stands would function similarly to a large clump of retention trees, providing habitat for those species of wildlife that are edge-related. These species would use the larger trees for nesting and roosting, and would use the adjacent younger forest for foraging and other life history needs. Additional use of these forest stands would be as a refugia for those species of wildlife associated with smaller-sized, older, Douglas-fir forests.

Thinning proposed Harvest Area 12 would increase the complexity of the stand, and increase the growth of the trees. The long-term cumulative impacts would be the presence of larger trees to provide snags and down logs. This would help complement the habitat provided by the Late-Successional stand.

In the future, it is possible that thinning would occur on private lands adjacent to the 200+ stands (units 5 and 14). Expected impacts would be small changes in the on-site climate for approximately 5 years.

4.1.8 Issue #8 - *What are the impacts from snag creation on wildlife, including impacts associated with noise from blasting trees for snag creation?*

Direct and Indirect Effects

Direct effects on wildlife species associated with snag creation management activities include increasing the amount of available habitat for cavity dependent wildlife. This would provide a habitat component that is currently lacking throughout the watershed. Additionally, secondary cavity users would benefit from this action as additional habitat becomes available. The direct effect of noise from using explosives would be an immediate loud noise heard for an estimated distance of one to five miles. Design features of seasonal restrictions for wildlife disturbance, and distance restriction for human disturbance, have addressed these effects.

Indirect effects to wildlife from snag creation would be in the form of increased diversity of habitat throughout the watershed. Newly created snags would attract some wildlife species and, as these snags decompose, a different variety of wildlife would be attracted to the snags. This would take approximately 7 to 20 years.

Cumulative Effects

Cumulative effects on wildlife species from snag creation throughout the watershed would include an increase in the number of cavity dependent wildlife

species. Population numbers of these species would increase as more habitat for nesting, roosting, and foraging becomes available. Insect populations may increase as more dead trees become available for a food resource. This would cause an increase in the health of the current populations of bat and insectivorous birds, and later on, an increase in the population numbers.

4.1.9 Issue #9 - *What are the impacts for adjacent landowners and people who use the watershed?* Specifically, what are the noise and visual impacts to landowners and what are the visual and road closure impact to recreationists and other users?

4.1.9.1 Noise Impacts to Private Landowners

Direct and Indirect Effects

The adjacent landowners would experience an increase in noise during active harvest operation on weekdays.

Cumulative Effects

No cumulative effects are expected.

4.1.9.2 Visual Impacts to Private Landowners

Direct and Indirect Effects

The Eugene RMP objective for the Rural Interface issue is to consider the interests of adjacent and nearby

rural landowners, including residents. It instructs the BLM to determine how landowners might be or are affected by activities on BLM administrated lands. In addition, the BLM is instructed to work with local landowners on design features and mitigation measures, so as to avoid/minimize impacts to health, life and property, and quality of life.

Since proposed Harvest Areas 2B & 4A are in the rural interface, more retention trees would be left within 50-75 feet from the proposed Harvest Area 4A boundary. This would maintain a windbreak for the private landowners, and would reduce the potential for windthrow occurring on their lands due to the harvesting on BLM land. Some landowners would experience a loss of tree tops and snags in the background of the view from their property. Some landowners would be able to see the harvest stand and would have a change in visual quality. Some of the decrease in visual quality would be mitigated by retaining trees to meet the rural interface requirement.

A temporary dirt road would be constructed to proposed Harvest Area 4A. After the harvesting, the road would be fully decommissioned; no defined roadbed would remain. This should reduce or eliminate the possibility of the public using the road to access the proposed Harvest Area or the adjacent landowner's property.

The landowner adjacent to proposed Harvest Area 2B above Road No. 19-1-33.1 would have a change in visual quality; an estimated 3 acres of proposed Harvest Area would be seen from the house.

There is a pocket of young trees (< 25 yrs old) on the western boundary of the proposed Harvest Area. The pocket of young trees would be reserved and would act as a filtering screen.

Road No. 19-1-3.1 would be decommissioned approximately 30 feet from the junction of 19-1-33.1 and 19-1-3.1. This would maintain the current use of the road, and the amount of disturbance the landowner experiences from people using the road. The landowner on the south end of the western boundary would have a RR between their property and the proposed Harvest Areas, therefore, the visual quality would be maintained.

Cumulative Effects

Harvesting 4A would increase the amount of opening in the surrounding areas. Most of the openings in the areas are farmlands and residential homes. There is a potential for more harvesting on small private lands, which would increase the visibility of proposed Harvest Area 4A.

Landowners adjacent to 2B would see more road traffic and from a

distance, would see 2B below the road until brush species and reprod screen out the road in approximately seven years.

4.1.9.3 Road Closure Impacts to Recreationists and Other Users

Direct and Indirect Effects

During the harvest of proposed Harvest Area 2B, Road No. 19-1-33.1 would be closed for a month on the weekdays during January or February. People would have to use an alternate route, which would take them longer to reach their destination. However, January and February are the lowest periods of use, so the impacts to recreationists and other authorized road users would be minimized.

Cumulative Effects

No cumulative effects are expected.

4.1.9.4 Visual Impacts to Recreationists and Other Users

Direct and Indirect Effects

Proposed Harvest Area 2B can be seen from Road No. 19-1-33.1. People using the road would have a decrease of visual quality as the harvesting would be seen for approximately 0.75 miles along Road No. 19-1-33.1. Additionally, another 0.25 miles on Road No. 19-1-33.1 would have visual impacts

from the commercial thinning. Proposed Harvest Area 4A can be seen from Road No. 19-1-33. Approaching from the east on Road No. 19-1-33, the harvest area would be visible in the background. The RR would serve as a visual buffer, so visitors would notice that the stand is more open. The road that would be constructed to access proposed Harvest Area 4A would be fully decommissioned. Visitors would see a tank trap to discourage use of the subsoiled and planted road.

Cumulative Effects

A six-year-old, 41 acre plantation is adjacent to proposed Harvest Area 2B. Harvesting of area 2B would increase the amount of openings in the area to 82 acres along an estimated mile of Road No. 19-1-33.1. The amount of opening on both sides of the road would be increased.

4.1.10 Issue #10 - *What would be the impact of harvesting and road management on survey and manage species?*

4.1.10.1 Mollusks

Direct and Indirect Effects

Potential direct effects of the proposed action include mechanical impacts from harvesting, and the subsequent dessication of some mollusks

because of loss of forest canopy. These effects would be greater in areas of regeneration harvests than in areas that are thinned, because more ground disturbance may result in physical impacts to more individual mollusks, and fewer retention trees may result in dessication of more individual mollusk. Dessication would be greatest along ridges and south facing slopes. Mollusk populations would be most resilient to habitat alterations on northern slopes and lower slope positions.

By releasing bigleaf maple trees from conifer competition, and by creating CWD, all harvest can have positive effects. The negative effects to mollusks tend to be short-term because of the immediacy of the impact to their current habitats. In the long-term, an indirect effect would be habitat improvement because of the shift from conifer dominance at known sites to a mix with larger bigleaf maples. In regeneration proposed Harvest Areas, any bigleaf maples that are cut would sprout multiple leaders that provide dense shade for local mollusks, and can develop into a broad canopy. Retained bigleaf maples would be released from competition, and the added CWD would provide additional habitat for mollusks.

The anticipation is that a reduction in the number of conifers would favor both bigleaf maples and the

associated mollusk fauna. A broad canopy of bigleaf maple favors swordfern, which in turn favors habitat for mollusk, and the presence of CWD provides habitat for fungus on which these mollusks may feed.

Neither the proposed action nor the alternatives would eliminate any of these mollusk species locally, or diminish their long-term distribution in the Lost Creek watershed because:

- These mollusks are known to have survived a wide range of disturbances, including thinning and regeneration harvests.
- Populations appear to benefit from timber harvesting when key habitat features (bigleaf maple and CWD) are retained.
- The climate of this region provides cool, damp conditions for most of the year, so management for mollusk sites is not focused on microclimate.
- Project Design Features manage all known sites, and the management is more conservative for areas of low and moderate mollusk abundance.

- Protected sites and RR would ensure that species can recolonize disturbed areas.

4.1.10.2 Fungi, Bryophytes and Lichens

Direct and Indirect Effects

Similar to the mollusks management recommendations, lichens, fungi, or bryophytes would be managed to maintain species viability at a local level and to maintain species across the landscape.

Helvella compressa (Component 1, fungi), direct impacts to the seven *Helvella compressa* sites within the harvest areas: direct physical disturbance from harvesting and related activities to individual organisms and/or disturbance of substrate. Indirect impacts include drying of substrate and increased light to individuals due to loss of forest canopy and alterations in local hydrology. However, *Helvella compressa* is known to occur at sites that have had extreme disturbance, such as near houses and in gardens.

Management recommendations for this species state that “Since they can occur in gardens, extreme stand disturbance, barring removal of the soils, may not impact this taxon”. The disturbance caused by harvest activities (both thinning and regeneration) probably will not eradicate *Helvella compressa* in

the harvest areas. Sites in no-harvest reserves would insure the presence of this species in the local area over time. Long term impacts of harvest on this species is unknown but its association with disturbed areas implies that harvest may not effect this species over time and may be creating new habitat.

Of the total of 37 sites contained within the areas surveyed , 8 fall within unthinned riparian reserves, 2 are in buffers for the fungi (these sites contained many fruiting bodies) and 7 fall within treatment areas. The twenty remaining sites occur in riparian reserves or reserves for special habitat areas, where no harvesting will occur. Of the seven within treatment areas, five are in thinnings and two are in a regeneration harvest area (proposed Harvest Area 2B).

Management recommendations state that “This taxa does not appear to be in need of special protection beyond that provided by the Northwest Forest Plan and the prospects of sustained habitat viability are excellent.” (S&M fungi) Protection provided by the riparian reserves mitigates for this species.

Eighty-one percent of *Helvella compressa* sites are within areas that will not be harvested. Twenty-one percent of sites are within harvest areas. *Helvella compressa* is known to withstand the

disturbance of harvest.

Helvella elastica (Component 1, fungi), the total of three sites all fall within no-harvest riparian reserves or management buffers. These buffers would prevent direct disturbance of the sites and mitigate any changes to microclimate by maintaining canopy at sites.

Neournula pouchetii (Component 1, fungi), one site in no-harvest riparian reserves. This buffer would prevent direct disturbance of the site and mitigate any changes to microclimate by maintaining canopy.

Sarcosoma latahense (Component 1, fungi), all three sites are in management buffers. These buffers would prevent direct disturbance of the sites and mitigate any changes to microclimate by maintaining canopy at sites.

Sarcosoma mexicana (Protection Buffer, fungi), all eleven sites are within no-harvest reserves, management buffers or special habitat areas. These buffers would prevent direct disturbance of the sites and mitigate any changes to microclimate by maintaining canopy at sites.

Ulotia megalospora (Protection Buffer, moss) Direct impact to this species are: direct physical disturbance from harvesting and related activities to individual organisms and/or disturbance of substrate. Indirect impacts include drying of substrate and increased light to individuals due to loss of forest canopy and alterations in local hydrology. As *Ulotia megalospora* is a pioneer bryophyte, its habitat may be improved by the canopy being opened up. These effects would be greater in areas regeneration harvested than in areas that are thinned, however the amount of light that *Ulotia* can tolerant is unknown. Short- term effects would be the removed of trees with *Ulotia* on them, causing a drop in the population. Long term effects may be an increase in habitat for this species.

As *Ulotia megalospora* is well-distributed and abundant within this watershed, and is not disjunct or localized, no buffers are required for this species. The species is found in riparian reserves (thinned and unthinned), and administratively withdrawn areas throughout the watershed. These areas provide sufficient protection for the species in this watershed and refugia. Thinning would probably have little effect on *Ulotia* and may actually increase the habitat for this species.

Neither the proposed action or the alternatives would eliminate any of these fungi or moss species locally or diminish their long-term distribution in the Lost Creek watershed because:

- These species are known to have survived disturbances including thinning and regeneration harvests.
- Protected sites and Riparian reserves would ensure that species can recolonize disturbed areas.
- All sites of less common species (*Helvella elastica*, *Neourula pouchetii*, *Sarcosoma latahense* and *Sarcosoma mexicana*) are within protected sites or no harvest reserves.

Cumulative Effects on Mollusks, Fungi, Bryophytes and Lichens

An estimated 9,500 acres of the BLM administered lands in the watershed are forested similarly (40+ years old) to those affected by the proposed action. An estimated 4,268 acres of the watershed is less than 40 years old, resulting from previous regeneration harvests.

The Proposed Action would affect 9.4 percent of the 40+ stands, and of that 9.4 percent, 1.4 percent would be regeneration harvested.

An estimated 4,465 acres of the forests over 40+ years old are in RR and are well-distributed across the watershed. These areas would provide continuity of habitat over time as similar proportion of age classes would be maintained across the watershed.

The management buffers at each sites, unthinned RR, Connectivity Blocks, unmapped LSRs, and other areas deferred from harvest would provide refuge for these species and, if individuals do not tolerate the harvests, the refuge would provide a potential source population to recolonize the harvested areas.

Based on this assessment, the proposed action would not pose any risk to local viability or distribution of these four fungi, one moss species and three mollusk species.

4.2 Alternative II - No Action

4.2.1 Issue #1 - *What are the impacts of harvesting activities and road management on the timing and magnitude of Peak Flow?* This specifically concerns the following actions:

- Timber harvesting on proposed Harvest Areas 7, 8, 9, 10, and 12 within in the transient snow zone.

- Planned road construction and road restoration work in the project area.

Direct and Indirect Effects

No direct or indirect effects would result from implementing this alternative since harvesting and proposed road management would not take place.

Although no restoration work would be conducted, existing stream flows would be maintained at the current condition. For that reason, ACS Objective 6 would be met.

Cumulative Effects

No decommissioning or drainage improvements would occur. This would maintain the current condition where existing roads, in some cases, act as extensions of stream systems and contribute to peak flows.

4.2.2 Issue #2 - *What are the effects of harvesting activities and road management activities on erosion and sediment delivery to water bodies?* Specifically in proposed Harvest Areas 7-10, restoration projects, road construction in the Riparian Reserves and flood projects. Consider the effects of planned activities on the water quality parameters, turbidity, and sedimentation. This specifically concerns the following actions:

- Construction of temporary stream crossings in proposed Harvest Areas No. 7 and 8.

- Replacement of failing log culvert in existing stream crossing in proposed Harvest Area 10 with a CMP sized to a theoretical 100 year storm event.
- Restoration of Stream #9 in proposed Harvest Area 10.
- Decommissioning roads in proposed Harvest Areas 2, 9, 10, and 11.
- Road restoration projects including repair of flood damaged Road No. 20-1-14.1.
- Road construction (with no stream crossings) and/or yarding activities in the RR areas in proposed Harvest Areas No. 2, 4, 5, 7, 8, 10, 11, 12, and 14.

4.2.2.1 Hydrology

Direct and Indirect Effects

Since harvesting, proposed road management, and restoration work would not take place, a direct effect is that excessive erosion would continue where a stream channel has been diverted by a failed skid road in proposed Harvest Area 10. An indirect effect of this alternative is that a potentially unstable stream crossing in proposed Harvest Area 10 could fail catastrophically, and seriously degrade downstream beneficial uses. Water quality would be impacted by such a failure, and the intent of ACS Objective 4 for watershed restoration would not be

met.

Cumulative Effects

In comparison to the Proposed Action and Alternative 3, none of the road restoration or improvement measures designed to reduce sediment delivery to streams from existing roads (i.e., additional relief drainage, stabilization of failing and eroding stream crossings, and stabilization or decommissioning roads on unstable slopes) would take place. Improvement of the sediment regime or water quality of the subbasins would not occur. The opportunity to conduct the identified restoration work that would eventually contribute to improved conditions in the watershed would be eliminated under this alternative.

4.2.2.2 Fisheries

Direct and Indirect Effects

No new crossing would be constructed. No existing culverts would be removed or replaced. The continued sedimentation would be in an area not associated with fish, therefore, no impacts are expected.

Cumulative Effects

There would be no cumulative effects.

4.2.3 Issue #3 - *What are the effects of timber and road management activities in the Riparian Reserves?*

Direct and Indirect Effects

No timber or road management action within the RR would result in no direct, indirect, or cumulative effects related to water temperature or soil productivity loss. ACS Objective # 1 would be delayed. The “No Action” alternative would delay the development of a complex vegetation stand structure for a period that may exceed several decades when compared with the proposed action. There would be no cumulative effects to wildlife.

Cumulative Effects

There would be no cumulative effects.

4.2.4 Issue #4 - *What are the Impacts of Harvesting Activities on a NSO Nest Site Adjacent to a Planned Harvest Area?*

Direct and Indirect Effects

It is highly likely that there would be continued occupancy and reproduction by a pair of NSOs located near one of the proposed Harvest Areas. Habitat conditions surrounding the nest locations, and nest site integrity, would continue to improve for the NSOs.

Cumulative Effects

There would be no cumulative effects.

4.2.5 Issue #5 - *What are the impacts of harvesting and road management activities on the CHU? Proposed Harvest Areas No. 2, 5, 6-9, and 14 are in the*

CHU.

Direct and Indirect Effects

The habitat within the CHU would not be degraded or downgraded, and roosting, foraging, and dispersal habitat would mature eventually into nesting habitat for NSOs. This would be the optimal conditions for Late-Successional forest related species. However, due to the checkerboard land ownership pattern within the watershed, and the practice of intensive forest management practices on privately owned forest lands, the watershed would not attain completed optimal conditions for Late-Successional forest related wildlife species. This would occur only on those lands managed by the BLM, and it would not happen for several decades.

Cumulative Effects

There would be no cumulative effects to wildlife species occurring in the watershed (BLM managed lands) because no road activity or harvesting activity would take place.

4.2.6 Issue #6 - *What are the effects of harvesting 80+ year-old stands on the remaining 80+ year-old stand network and Late-Successional species?*

Direct and Indirect Effects

The 84 acres of the 80+ year-old stands scheduled to be harvested under the Proposed Action would not be

harvested. Forest stands surrounding these would continue to mature, and large areas of these older forest stands would develop after several decades. Interior forest conditions would begin to develop. These older forest stands would continue to provide refuge for a wide variety of wildlife species.

Cumulative Effects

There would be no cumulative effects.

4.2.7 Issue #7 - *What are the effects of harvesting activities adjacent to 200+ year-old stands?*

Specifically, harvesting Proposed Harvest Area #14, 12 and 5E.

Direct and Indirect Effects

Forest stands surrounding these 200+ year-old stands would continue to mature, and large areas of these older forest stands would develop after several decades. Interior forest conditions would begin to develop. These older forest stands would continue to provide refuge for a wide variety of wildlife species.

Cumulative Effects

There would be no cumulative effects.

4.2.8 Issue #8 - *What are the impacts from snag creation on wildlife, including impacts associated with noise from using explosives for snag creation?*

Direct and Indirect Effects

Current conditions in the watershed indicate that there is a lack of snags for cavity nesting species. Creating snags through the proposed alternative would provide for this habitat component. Without creating snags, the population sizes of cavity nesting wildlife species would remain the same, or may decline, because of the lack of existing and replacement snags. As existing snags decompose or fall, there would be no snags large enough to replace this habitat component, and population numbers would decline.

Cumulative Effects

There would be no cumulative effects.

4.2.9 Issue #9 - *What are the impacts for adjacent landowners and people who use the watershed? Specifically, what are the noise and visual impacts to landowners and what are the visual and road closure impact to recreationists and other users?*

Direct and Indirect Effects

No direct effects would result from "No Action" because no road construction or harvesting would take place. Indirect effects would be from natural changes that would occur over time. The increase or decrease in visual quality would be gradual.

Cumulative Effects

There would be no cumulative effects.

4.2.10 Issue #10 - *What would be the impact of harvesting and road management on survey and manage species?*

Direct and Indirect Effects

There would be no direct effects from this alternative. The only indirect effects would be changes to habitat as caused by forest succession and weather events. The habitat of *Ulotia megalospora*, a pioneer species, could be reduced as the canopy closed.

Cumulative Effects

There would be no cumulative effects.

4.3 Alternative III

4.3.1 Issue #1 - *What are the impacts of harvesting activities and road management on the timing and magnitude of peak flow?* This specifically concerns the following actions:

- Timber harvesting on proposed Harvest Areas 7, 8, 9, 10, and 12 within the transient snow zone.
- Planned road construction and road restoration work in the project area.

Direct and Indirect Effects

The direct and indirect effects of timber harvesting, within the transient snow zone, on peak flow would be comparable to those described under the Proposed Action.

Under this alternative, 2.68 fewer miles of temporary road would be constructed than under the Proposed Action, since some of the timber harvesting would be conducted by helicopter. Following harvest activities, the same temporary roads decommissioned under the Proposed Action would be decommissioned under this alternative. Since no riparian harvesting would occur under this alternative, an existing road in proposed Harvest Area 8 with two stream crossings would be decommissioned as a Restoration Project, rather than in conjunction with timber harvesting. As in the Proposed Action, fully decommissioning roads, and adding cross drains on existing permanent roads where needed, would play an important role in contributing to a reduction of road related run-off in the watershed. As a result, the timing and magnitude of in-stream flows would be maintained or restored to a more natural condition, and the intent of ACS Objective 6 would be met.

Cumulative Effects

As compared to the Proposed Action, no cumulative effects to peak flow would occur under this alternative.

4.3.2 Issue #2 - What are the effects of harvesting and road management activities on erosion and sediment delivery to water bodies? Specifically in proposed Harvest Areas No. 7 - 10, restoration projects, road construction in the RR, and flood projects. Consider the effects of planned activities on the water quality parameters, turbidity, and sedimentation. This concerns the following actions:

- Construction of temporary stream crossings in proposed Harvest Areas 7 and 8.
- Replacement of failing log culvert in existing stream crossing in proposed Harvest Area 10 with a CMP sized to a theoretical 100-year storm event.
- Restoration of Stream #9 in proposed Harvest Area 10.
- Decommissioning roads in 2, 9, 10, and 11.
- Road restoration projects including repair of flood damaged Road No. 20-1-14.1.
- Road construction (with no stream crossings) and/or yarding activities in the RR areas in proposed Harvest Areas 2, 4, 5, 7, 8, 10, 11, 12, and 14.

4.3.2.1 Hydrology

Direct and Indirect Effects

In comparison to the Proposed Action, the previously discussed direct and indirect effects of sediment delivery to streams, during construction and removal of temporary stream crossings, would involve fewer proposed Harvest Areas and streams under this alternative. Approximately 2.68 miles of temporary road would not be constructed in proposed Harvest Areas 5, 7, 8, 12 and 14. Three stream crossings in proposed Harvest Area 7, and one in proposed Harvest Area 8, would not be constructed. Impacts at stream crossings would remain primarily short-term in nature.

ACS Objectives 3, 4, and 5 would be met under this alternative because the stream banks and channel bottoms would be restored to a natural condition, and water quality and the natural sediment regime would be improved.

Cumulative Effects

No additional cumulative effects, with regard to erosion and sediment delivery, would be anticipated under this alternative. Four fewer temporary stream crossings are proposed under this alternative as compared to the Proposed Action. There would be less road construction in the vicinity of RR. In the case where roads are not subsoiled, they would be left in an erosion resistant condition so that sediment from a decommissioned

road would not reach nearby streams.

4.3.2.2 Fisheries

Direct and Indirect Effects

Nine stream crossing sites would be affected by this action (proposed Harvest Areas 7, 8, 10). This would mean five less stream crossing sites than the Proposed Action. After the roads have been decommissioned, seven of these stream crossings would be allowed to flow freely. Although no crossings would be on fish-bearing streams, downstream fish could be affected by sediment generated by the construction or removal of culverts. The nearest fish-bearing streams are between 500 feet (proposed Harvest Areas 8 and 10) and one mile (proposed Harvest Area 7) away from these locations. Fish at these distances should not suffer any negative effects of the actions, since they would be conducted during the summer, and are not located in areas with high potential for landslides or debris torrents. Alternative III would not prevent the attainment of ACS Objective #4.

Cumulative Effects

The effects are the same as those addressed in the Proposed Action.

4.3.3 Issue #3 - *What are the effects of timber and road management activities in the Riparian Reserves?*

No RR thinning would occur. Management activities would be snag creation and road management. This would concern the following proposed Harvest Areas: 2A, 4, 5C, and 10.

4.3.3.1 Hydrology

Direct and Indirect Effects

There would be no impact to stream temperatures as a result of timber activities since no thinning would occur in the RR under this alternative. As compared to the Proposed Action, helicopter logging would reduce the number of roads needed for harvesting activities. As a result, fewer openings in the riparian canopy would be made since several stream crossings would not be necessary. There would be no direct or indirect effects to stream temperature caused by proposed stream crossings.

Cumulative Effects

There would be no cumulative effects.

4.3.3.2 Soils

Direct and Indirect Effects

As no harvest would occur within the RR, there would be less direct and indirect effects under this alternative, as compared to the proposed action. Soil displacement from yarding would be eliminated, and 2.68 miles less temporary road would be

constructed under this alternative. Less subsoiling would need to be done to regain infiltration and productivity from these compacted road surfaces. Productivity losses associated with the new road into proposed Harvest Area 7 would not occur.

Cumulative Effects

There would be no cumulative effects .

4.3.3.3 Wildlife

Direct and Indirect Effects

Alternative III would delay the restoration of Late-Successional forest structure, diversity, and complexity and the associated species that find this forest structure essential for their life cycles. ACS Objective # 1 would be delayed.

Indirect effects associated with timber management adjacent to RR would result in increased space and light to the vegetation in the RR bordering the management action. This effect would result in no substantive changes to the interior region of the reserve.

Indirect effects associated with road management within the RR would occur following the decommissioning or rehabilitation of existing roads. Vegetation responds to these road openings as gaps and these areas develop into pockets of younger forests, increasing diversity for wildlife species. This development is expected to occur

over a 10-20 year period. (ACS objective #9)

Cumulative Effects

There would be no cumulative effects.

4.3.3.4 Fisheries

Direct and Indirect Effects

There are no roads proposed for construction, reconstruction, decommissioning, or restoration that cross fish-bearing streams at the location of the crossing. Therefore, no direct impacts to fish are expected from these activities.

Cumulative Effects

No cumulative effects from road management in the RR are expected. Most of the stream crossing sites are located in the Osage Creek drainage about 2.5 to 3 miles from the confluence with Lost Creek. Steelhead probably would use approximately the lower half mile of Osage Creek for winter spawning, and would not be affected.

4.3.4 Issue #4 - *What is the impact of harvesting activities on a NSO nest site adjacent to a planned timber sale harvest area?*

Direct and Indirect Effects

Direct effects on the NSO nest site adjacent to a proposed Harvest Area

would decrease compared to the Proposed Action. The proposed Harvest Area that contains two of the three nest trees would not be harvested; nest site integrity would remain around all nest trees.

Indirect effects would be less than those described in Alternative I because this alternative maintains 40 acres of suitable habitat around a couple of old nest trees. By retaining the 40 additional acres around this owl site, there is a greater chance that this pair would continue to occupy this site when compared to Alternative I.

Cumulative Effects

The effects are the same as those addressed in the Proposed Action.

4.3.5 Issue #5 - *What are the impacts of harvesting and road management activities on the CHU? Proposed Harvest Areas No. 2, 5, 6-9, and 14 are in the CHU.*

Direct and Indirect Effects

The effects are the same as those addressed in the Proposed Action.

Cumulative Effects

The effects are the same as those addressed in the Proposed Action.

4.3.6 Issue #6 - *What are the effects*

of harvesting 80+ year-old stands on the remaining 80+ year-old stand network and Late-Successional species?

Direct and Indirect Effects

The effects are the same as those addressed in the Proposed Action.

Cumulative Effects

The effects are the same as those addressed in the Proposed Action.

4.3.7 Issue #7 - *What are the effects of harvesting activities adjacent to 200+ year-old stands? Specifically, proposed Harvest Areas 5E, 12, and 14.*

Direct and Indirect Effects

The effects are the same as those addressed in the Proposed Action.

Cumulative Effects

The effects are the same as those addressed in the Proposed Action.

4.3.8 Issue #8 - *What are the impacts from snag creation on wildlife including impacts associated with noise from using explosives for snag creation?*

Direct and Indirect Effects

The effects are the same as those

addressed in the Proposed Action.

Cumulative Effects

The effects are the same as those addressed in the Proposed Action.

4.3.9 Issue #9 - *What are the impacts of harvesting on the visual quality for adjacent landowners and people who use the watershed?*

Direct and Indirect Effects

The effects are the same as those addressed in the Proposed Action.

Cumulative Effects

The effects are the same as those addressed in the Proposed Action.

4.3.10 Issue #10 - *What would be the impact of harvesting and road management on survey and manage species?*

Direct, Indirect and Cumulative Effects

The direct, indirect, and cumulative effects would be the same as those discussed in Alternative 1 with the exception that this alternative would affect 8.4 percent of the 40+ years old stands, and of that 8.4 percent, 1.7 percent would be regeneration harvested.

4.4 Other Environmental Effects - Common To All Action Alternatives

4.4.1 Unaffected Resources

The following either are not present or would not be affected by any of the alternatives: Areas of Critical Environmental Concerns, prime or unique farm lands, flood plains, Native American religious concerns, solid or hazardous wastes, Wild and Scenic Rivers, Wilderness, Minority populations, and low-income populations.

4.4.2 Wetlands

Since no ground disturbing activities would occur in meadows and wetlands, the hydrology in these sensitive areas would be maintained in the current condition, and the intent of ACS Objective 7 would be met.

4.4.3 Recreation

The Action Alternatives would not have any adverse effects on the dispersed recreational opportunities existing in the project area. Proposed road closures and decommissioning would not affect future vehicle access opportunities into the Lost Creek Watershed. The proposed Harvest Areas are subject to the Visual Resource Management (VRM) Class IV management prescription under the 1995 Eugene District RMP. There are no Wilderness

Areas, Roadless Areas, or Wild and Scenic Rivers in, or adjacent to, the analysis area.

4.4.4 Sensitive Plant

Special Status plants surveys have been conducted on all proposed Harvest Areas. All sites of Special Status plants located would be protected using design features (boundaries adjusted to exclude known sites, see Appendix A). The list of Special Status Plants includes species on the Survey and Manage vascular plant list (flowering plants). Known sites of Special Status Plants would be monitored by BLM personnel. A Bureau Sensitive Special Status Plant species was located in an existing road in proposed Harvest Area 2, and another in an adjacent area that is no longer part of the proposed sale harvest area.

4.4.5 Threatened and Endangered Species

There are three known NSO sites located adjacent to three of the proposed Harvest Areas. However, these sites have established core areas and no impact would be associated with those core areas. The planned conservation strategy for the NSO within the NFP relies on a system of large reserve areas; viable owl populations outside these reserves are not entirely essential for the conservation of the species. Impacts to the conservation of the species were considered during formal consultation

with the USFWS. This action was consulted on in the Fiscal Year 1999 Habitat Modification Projects within the Willamette Province Biological Assessment. The resulting USFWS Biological Opinion states these projects: “are not likely to jeopardize the continued existence of the spotted owl.”

Oregon chub, an endangered minnow, lives in the lower reaches of Rattlesnake Creek. Proposed Harvest Area 11 is located in the headwaters, approximately seven miles away. The USFWS has concurred with our determination of a “No Effect” on Oregon chub for this action. Consultation with the National Marine Fisheries Service on the potential effects of this action on spring chinook salmon and winter steelhead will be conducted prior to making a decision.

4.4.6 Cultural Resources

No cultural sites have been identified. Therefore, there would be no direct, indirect or cumulative effects to cultural resources.

4.4.7 American Indian Rights

No impacts on American Indian social, economic, or subsistence rights are anticipated. No impacts are anticipated on the American Indian Religious Freedom Act. Management action information was sent to the Confederated Tribes of the Grand Ronde, and Confederated Tribes of the Siletz.

5.0 LIST OF AGENCIES AND PERSONS CONSULTED

This Environmental Analysis is being mailed to 22 members of the public or organizations that have requested to be on the mailing list. A letter was sent to the adjacent landowners in December 22, 1997 that identified specific areas being considered, project issues, and time lines for providing input. A summary was sent to those receiving the "Eugene BLM Planning and Project Focus" Winter 1997 (approximately 250 mailings - a complete listing is available at the Eugene District Office).

Maps of the Proposed Action were sent to the Confederated Tribes of the Grand Ronde and Confederated Tribes of Siletz in December 1997. No comments were received.

6.0 LIST OF PREPARERS

THE INTERDISCIPLINARY TEAM

Each member has reviewed this EA and concurs with its contents.

NAME	TITLE	RESOURCE / DISCIPLINE
Mabel Alejandro Rudy Wiedenbeck	Soil Scientist Soil Scientist	Soils Soils
Jack Zwiesler	Forester	Timber
Greg Miller Bill Dean	Wildlife Biologist Wildlife Biologist	Wildlife Habitat Wildlife Habitat
Michael Southard Beth Clarke	Archaeologist NRS Technician	Cultural Resources
Lynn Larson	Forest Ecologist	Silviculture
Cheshire Mayrsohn	Botantist	Botany
Dave Reed Phil Dills	Fuels Technician Fuels Specialist	Fuels / Air Quality
Glen Gard	Natural Resource Protection Specialist	Hazardous Materials Coordinator
Karen Martin	Fisheries Biologist	Fisheries
Greg Bashor	Engineering	Roads / Transportation
Kris Ward	Hydrologist	Water Resources
Don Wilbur	Natural Resource Protection Specialist	EA Writer
Trish Wilson	Landscape Planner	Team Leader

DESIGN FEATURES FOR ACTION ALTERNATIVES AND MONITORING

Design features include timber sale design, contract stipulations, and prescribed activities to be accomplished by the BLM or timber sale purchaser. The objective of these design features is to maintain or enhance the quality, quantity, and productivity of the resources in the analysis area.

1. Require lead-end suspension of logs wherever topography permits (including thinning in the Riparian Reserves). Intermediate supports would be required, if necessary, to achieve lead-end suspension. Areas yarded with ground-based equipment would follow "Best Management Practices" as described in the Eugene District RMP.
2. For designated skid trails where ground-based harvesting is accomplished in regeneration harvest units, subsoil compacted trails and temporary roads, and plant following harvesting activities.
3. Management activities would be altered according to RMP Standards and Guidelines if any cultural resources, Special Status Plants including Threatened and Endangered Survey and Manage Species, or Threatened and Endangered Wildlife are found in or adjacent to the harvest areas.
4. Falling and yarding requirements: Directional falling and yarding would be utilized for the protection of retention trees, snags, and reserve areas.
5. To provide habitat for cavity dependent wildlife, and to protect the future source of down logs, no marked reserve trees would be removed from the regeneration harvest areas. Directional felling and yarding would be utilized to protect snags consistent with State safety practices. Snags felled as danger trees would be retained on site as Coarse Woody Debris (CWD).
6. Adjust timber harvesting boundaries to exclude all Fragile-Nonsuitable and withdrawn areas from the harvest area. Fragile-Nonsuitable areas include sites with shallow, rocky soils, potentially unstable slopes, and wetlands. Reforestation withdrawn areas include sites with excess surface rock.
7. Apply the following operational restrictions and mitigation measures so harvest activities result in an insignificant (i.e., less than 1 percent per decade) growth-loss effect from soil compaction (2 percent or less of any treated area compacted after amelioration practices):
 - Restrict ground-base yarding operations to slopes less than 35 percent to reduce the amount of soil disturbance.

- Restrict yarding to seasonally dry periods when soil moisture levels are less than 25 percent, as approved by the Authorized Officer, and during which puddling and shearing can be avoided.
 - Preplan and designate all skid trails to occupy less than 10 percent of the harvest area. Require felling of trees to lead to the skid trails, maximize winching distances up to 100 feet, and the distances between trails up to 200 feet where feasible. Use existing skid trails wherever possible.
 - Avoid ground-based yarding on areas where soil compaction cannot be mitigated, i.e., generally refers to soils with moderate to high amounts of surface rock or rocky subsoil, as determined on a site-specific basis. This may include the following soils: **Klickitat** series, **Ritner** series, and **Bellpine** cobbly silty clay loam (see soils report in EA file).
 - Ground-based harvesting would not be allowed on the following moderately well to somewhat poorly drained soils: **Cumley** and **Hazelair** (see soils report in EA file).
 - No ground-based activities on the following wetland soils: **Minniece**, **Panther**, and **Waldo** series (see soils report in EA file).
 - Till all skid trails with a winged subsoiler as soon as possible after yarding, when soil moisture conditions are 25 percent or less, or as approved by the Authorized Officer in consultation with a Soil Scientist.
8. To minimize loss of soil productivity and reduce the potential for surface erosion and run-off during yarding:
- Lead-end (front-end) suspension is required for logs above the ground during yarding wherever topography permits, and especially when yarding over (1) rocky, erodible soils, i.e., **Klickitat** series, **Ritner** series, and **Bellpine** cobbly silty clay loam, and (2) soils with a seasonally high water table, i.e., **Cumley** and **Hazelair** series.
 - Require full suspension of logs over the ground surface during yarding when it is necessary to cross streams with fragile banks and sideslopes, unstable and/or steep streambanks and headwalls, and TPCC designated Fragile soils.
9. To minimize the impacts of regeneration harvest on private lands adjacent to the proposed actions, trees would be reserved from harvest to maintain or protect the private resource values. On the east and south line of Harvest Area 4 a wind buffer of between 50-75 feet would be left at a density to maintain forest stand stability on the adjacent private lands. On the west line of Harvest Area 2, trees would be left to provide a visual buffer between the homeowner and the harvest action. This buffer would include young second growth conifers and hardwoods. Mature retention trees would be located along the common property line, but set back a safe distance from the private residence. The residual trees would be made up of legacy trees, future snag trees, and additional trees to meet or obtain the Eugene District's rural interface objective.

10. The small pocket of young trees on the west boundary of proposed Harvest Area 2B would be protected from logging impacts. The young trees function as a filtering screen to proposed Harvest Area 2B.
11. Reduced logging truck speed would be required on Eagles Rest Road No. 19-1-33.1 from Harvest Area 2 to Lost Creek Road during the periods of 7:00 a.m. to 9:00 a.m., and 2:30 p.m. to 4:00 p.m., because of local traffic risk.
12. Harvest Area 2A would be harvested during the months of January and February to minimize the impact of closing Road No. 19-1-33.1. Road No. 19-1-33.1 would be closed because of the need to have the logging equipment on the roadway.
13. The public would be notified in the newspaper when Road No. 19-1-33.1 is scheduled to be closed.
14. On roads identified by the interdisciplinary team as infested with Scotch Broom (*Cytisus scoparius*), broom would be cut before logging to prevent its spread into the units. Roads identified for this are: Road No. 19-1-13.1 of Harvest Area 2, and Road No. 20-1-9.3 of Harvest Area 6.
15. A Bureau sensitive plant occurs in Harvest Area 2. This species is a winter blooming annual that requires some disturbance to be maintained on the site. The species naturally occurs in areas where the soil is disturbed by seasonal flooding, overland water flow, or animals. Due to reduced habitat and

human-caused disturbance, the species now occasionally occurs along roads through and near seasonal wet areas. The following design features would ensure this species viable population:

- Logging of the area (upper part of Harvest Area 2B) that requires the use of Road No. 19-1-13.1 shall be restricted to July 1st through December 31st of one year; there will be no use of Road No. 19-1-13.1 from January 1st through June 30th. The logging should take place all during one year to minimize the duration of the disturbance to the site.
- Before logging or road improvement takes place, move the rocks, that currently block the road, over to the ditch to protect part of the population in place.
- Before logging or road improvement takes place, and after the annual plants have set seed (mid-May to early July), scrape the top two inches of soil off the site, stockpile this soil nearby. This would prevent the loss of the soil seedbank through the logging.
- After logging is completed (in November or December), put the stockpiled soil back on the site in early winter (when the plants germinate). The turn-around spot (approximately the first 30 feet) of the road should be put back into its present condition. The rest of the road can be decommissioned as planned.

16. Apply seasonal restrictions on all harvest activities that would occur within 1/4 mile of known nesting spotted owls, osprey, eagles, herons, accipiter hawks, and winter roost locations.
17. No road construction or decommissioning operations would take place during the crucial nesting periods for raptors, herons, owls, eagles and other special status species, if the location of the construction is located within 1/4 mile of the nest location.
18. All adjacent Riparian areas retained interim widths for fish and aquatic habitats as defined in NFP ROD.

PROJECT DESIGN FEATURES COMMON TO ALL REGENERATION AREAS

19. The regeneration harvest areas would be leave-tree marked for required snags (3.4 trees per acre; marked trees would be ≥ 15 " in diameter distributed across the diameter range); green tree retention (7 trees/acre averaged over the area; minimum diameter for trees marked in clumps is ≥ 8 ", and trees scattered throughout the unit would be ≥ 14 "; trees would be marked in all existing diameter classes and mimic the diameter distribution in the stand).
20. CWD requirements: Leave 240 linear feet of logs per acre greater than or equal to 20 inches in diameter. Logs less than 20 feet in length would not be credited towards this total.

21. For the purpose of long-term productivity and maintenance of biological diversity, retain all down material of advanced decay for CWD (class 3, 4, & 5).

PROJECT DESIGN FEATURES COMMON TO THINNING ACTIONS

22. Snags and large remnant trees would not be cut, except those in the temporary road construction right-of-way, and those posing a safety hazard.
23. Log lengths would be limited to 40 feet in order to protect residual trees during yarding.
24. Thin from below, cutting suppressed, intermediate, and some co-dominants. Residual tree spacing would be approximately 19-22 foot spacing, which would leave approximately 90 to 120 trees per acre. Trees larger than 24 inches DBH would be reserved, except for trees inside the thinning corridors.
25. Yarding restriction during sap flow is April 1 through June 15.

DESIGN FEATURES FOR ROAD PLANNING, DESIGN AND CONSTRUCTION ACTIVITIES

Apply the "Best Management Practices" (BMPs), as described in the Eugene RMP, Appendix C, to reduce the percent of the landbase permanently converted to roads or landings.

These BMPs would also be utilized to maintain water quality (ACS Objective #4), natural sediment transport in stream channels (ACS Objective #5), and to maintain in-stream flow (ACS Objective #6), that include:

26. No road construction would be conducted on potentially unstable areas, including over-steepened headwalls and sideslopes adjacent to streams.
27. Wetlands would be avoided entirely when constructing new roads (ROD/S&G).
28. Where the potential for sediment delivery exists on permanent roads, these roads would be surfaced with rock aggregate to minimize road surface erosion. Review existing roads that would be used for a timber sale to identify opportunities to install relief drainage features. In particular, use cross drains, drainage dips, and/or lead-off ditches to reduce the amount of sediment delivered to streams via the cutslope ditch. Avoid discharging relief drains into the erodible or unprotected slopes, or into stream channels.
29. Place relief drainage features immediately upgrade of stream crossings to prevent cutslope ditch sediment from entering the stream.
30. Locate cross drains or dips in such a manner as to avoid outflows onto unstable terrain such as headwalls and steep stream sideslopes. Provide adequate spacing to avoid accumulation of water in ditches or surfaces through these areas.
31. Where feasible, design culvert placement on a straight reach of stream to minimize

erosion at both ends of the culvert. Design adequate stream bank protection (i.e., riprap) where scouring could occur.

32. Replace existing road stream crossings that are (1) failing and otherwise depositing excess sediment into streams, or (2) undersized and located in an area with moderate to high potential for slope failures.
33. Consider future maintenance needs and concerns, i.e., road surface erosion and the potential for sediment delivery to streams, when designing roads. For instance, avoid permanent stream crossings wherever possible, as they require substantial maintenance.
34. Use the theoretical 100-year storm event as design criteria for permanent culverts. Keep culverts as wide as the channel, if possible. Countersink permanent culverts 6-8 inches below the streambed to minimize scouring at the outlet. Increase culvert diameters accordingly to minimize chances of plugging. Try to keep culverts at the same gradient or greater than the natural stream channel. Place riprap on any fill material next to permanent culvert inlets and outlets.
35. Use rock that is as soil-free as possible for fill material when installing temporary culverts. Whenever possible, use washed river rock covered by crushed rock as a compacted running surface.

36. Design for the smallest fill possible at stream crossings. Maintain vegetation at the margins of the stream channel approach since the vegetation helps keep the channel stable and often acts as a “trash rack” for woody debris.

DESIGN FEATURES FOR ROAD DECOMMISSIONING OR RESTORATION AND MONITORING

Apply the following BMPs to (1) reclaim roaded areas, (2) reduce the potential for road surface erosion, road-related slope failures, and subsequent sediment delivery to streams, and (3) maintain water quality (ACS Objective #4) during removal of temporary stream crossings or stream crossings no longer needed:

37. Reclaim all new, temporary, dirt surface roads upon completion of operational activities. Remove any stream crossings, including recontouring of the channel sideslopes and seeding and/or planting of bare areas with native plant species for erosion control, as required. Subsoil the road surface and block the entrance into the area to discourage further vehicle use and improve the recovery rate of the site. Remove stream crossing drainage structures and in-channel fill material during low flow and prior to fall rains. Reestablish natural drainage configuration. Limit activities of mechanized equipment in the stream channel to the area that is necessary for installation and removal operations.
38. Avoid rock new, temporary roads scheduled for decommissioning once operational activities are completed.

39. Decommission existing or new surface roads with no identified future entry needs (10 years). At a minimum, remove all stream crossings and drainage features. For stream crossings, recontour the channel sideslopes and seed and/or plant bare areas with native plant species for erosion control, as required. Where decommissioned roads will not be subsoiled, construct drainage dips, water bars, lead-off ditches, etc. to improve drainage of the surface and otherwise leave the road in an erosion resistant condition. Block entrance into the area to discourage further vehicle traffic.

40. Place a high priority on decommissioning existing roads with recent or active failures, or with a moderate to high potential for future road-related slope failures, i.e., Road Nos. 19-1-3.1 adjacent to Harvest Area 2; 19-2-24.1 in Harvest Area 11, 20-2-1 (log culvert); and 19-2-24.1 in Harvest Area 10, and 20-1-21.4, and 20-1-21.6 near Harvest Areas 8 and 9.

DESIGN FEATURES FOR SITE PREPARATION AND MONITORING

Piling using a backhoe-excavator is the preferred machine piling method since it results in less soil compaction and displacement than traditional tractor piling methods. Apply the following operational restrictions and mitigation measures so backhoe-excavator piling activities result in insignificant disturbance (2 percent or less of any treated area compacted after amelioration practices):

41. Backhoe-excavator operations are best restricted to slopes of less than 40 percent.
42. **McDuff** soils have loam to clay loam surface textures and are well-drained. Piling operations on these soils should take place when soil moisture content is less than 35 percent. **Hembre** and **Klickitat** soils have loamy surface textures and are well-drained. However, they often occupy slopes greater than 40 percent.
43. **Bellpine, Honeygrove, Peavine, and Ritner** soils have heavy silty clay loam and heavy silty clay surface textures and are well-drained. Piling operations on these soils should take place when soil moisture content is less than 35 percent, and a period of summer drought has taken place, ideally between August and the first fall rains.
44. **Cumley** soils have heavy silty clay surface textures and are moderately-well to somewhat poorly-drained. Piling operations on these soils should take place when soil moisture content is less than 25 percent, and a period of summer drought has taken place. Even under these conditions, the capacity of this soil to be slowly-drained and hold substantial water in the subsoil may result in soil compaction damage beyond District standards. The decision to conduct backhoe-excavator piling operations on these soils should be done in consultation, and after a site review by a Soil Scientist.
45. During rainy periods, piling operations should be terminated and not resume until the Authorized Officer has investigated soil moisture conditions, and the surface soils have had an opportunity to dry.
46. Direct the operator to cross the unit as efficiently as possible in order to minimize the number of trails, and to limit the number of passes over the same area to one time.
47. Keep the excavator moving on top of slash whenever possible. This is especially critical when soil moisture levels are greater than 30 percent, soils are heavy in clay, and when working soon after a rainy period.
48. Avoid crossing streams or drainages, and do not cross wetlands.
49. When soil compaction resulting from site preparation activities is beyond BLM standards, the compacted areas will be tilled with properly designed equipment to achieve insignificant growth-loss from compaction.
50. Manage the machine piling operations so as not to overachieve the objective of the piling effort by piling more slash than is necessary for improving planting spot access. A light machine piling treatment limits the amount of litter and other debris removed from the site, and reduces the risk of incurring higher levels of soil compaction and soil displacement.

The table below summaries the treatments that the harvest areas would receive under the action alternatives:

TREATMENT FOR SITE PREPARATION

Area No.	Receive Treatment	Machine Pile & Burn (est. % of Area)	Handpile & Burn (est. % of Area)	Burn Landing Piles	Wildlife piles left on the Area	Remarks
2A	None			Yes		25' pullback along 19-1-33.1
2B	Yes	75%	25%	Yes	Yes	
4	Yes	89%	11%	Yes	No	
5	None			Yes	Yes	
6	Yes	75%	25%	Yes	Yes	
7	None					
8	None					
9	Yes	40%	30%	Yes	Yes	no treatment on 30%
10	None					
11	None					
12	None					
13	None					
14	Yes	46%	54%	Yes	yes	
15	Yes		80%	Yes		20% - no treatment

51. Burning of piles would be of short duration; however, final decision would be made by Oregon Department of Forestry through Smoke Management Advisories. The burning of piles would occur between Nov. 1 and Jan. 1 when the most favorable emission dispersion conditions are possible. The burning of piles may occur over several days. It is not anticipated that the burning of piles would exceed the National Ambient Air

Quality Standards or the State Implementation Plan for air quality.

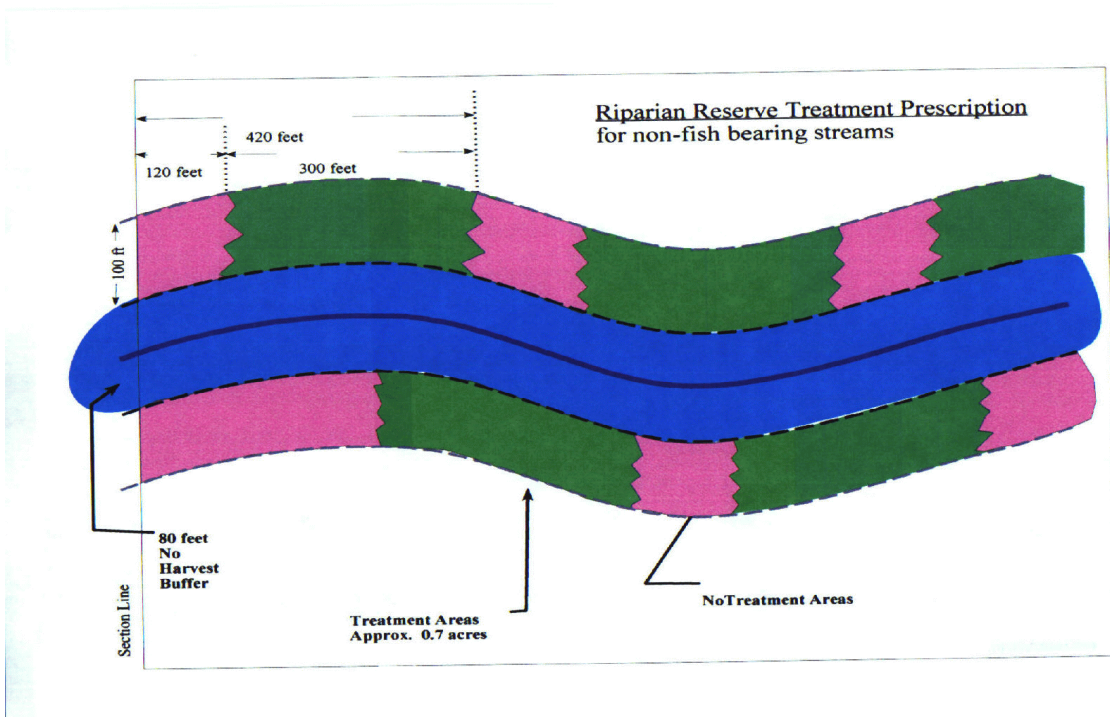
52. Residual material that may be piled on landings along existing roads, or down material (except reserved coarse woody debris) that could be reached from existing roads, would be available for disposal as Special Forest Products such as firewood, fence posts, or poles.

DESIGN FEATURES COMMON TO RIPARIAN RESERVE ACTIONS AND FOR MONITORING

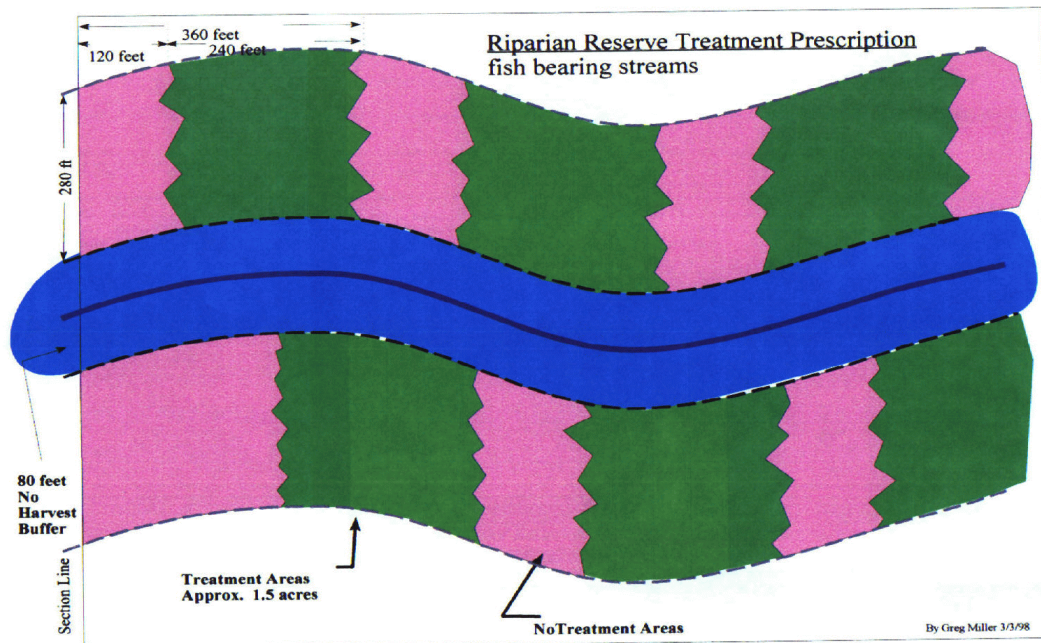
In addition to the design features listed above, the following practices would be applied for thinning within RR under the Proposed Action:

53. Retain a minimum no treatment buffer of 80 feet from any intermittent or perennial stream.
54. Minor species such as western red cedar, western hemlock, and grand fir would be given priority as leave trees. Trees larger than 24 inches DBH would be retained, except for trees inside the thinning corridors.
55. Retain hardwoods except where there are safety concerns.
56. Directionally fell trees away from streams and any water features. Care would be taken during the felling and logging operations to protect and minimize damage and dislocation to all existing down logs.
57. One-end suspension would be required within the Riparian Reserves when cable yarding is recommended. When tractor logging occurs in Riparian Reserves, skid trails would be approved by the BLM before any on-the-ground activity takes place.
58. If yarding through the Riparian Reserve or wetland is necessary, and the actions result in an overall benefit to the area, restrict corridors to the minimum number feasible, and fully suspend logs when yarding over water and adjacent banks.
59. Allow no Riparian Reserve thinning on unstable or slopes >60 percent.
60. Where ground-based yarding methods are utilized within the Riparian Reserve, subsoil all compacted skid trails, landings, and other surfaces with a properly designed winged subsoiler.
61. Each of the Riparian Reserve areas that have been identified by the IDT would have approximately 1/3 of the entire area treated.

Below is a diagram describing the Riparian Reserve treatment prescription on a non-fish bearing stream. Site tree potential in Lost Creek is 180 feet on each side of the stream for non-fish bearing streams. With an 80 foot no-harvest buffer immediately adjacent to the stream, treatment would be limited to alternating uneven pieces of 100 foot by 300 foot segments, adding up to approximately 0.7 acre of treatment on each segment.



Below is a diagram describing Riparian Reserve treatment prescription on fish-bearing streams. The buffer width for fish-bearing streams is 360 feet for each side of the stream, the length of 2 potential site trees (180 feet). Under this prescription, a no-harvest continuous buffer of 80 foot is immediately adjacent to the stream. Treatment would be limited to alternating uneven pieces of 280 foot by 240 foot segments, adding up to approximately 1.5 acres of treatment on each segment.



Design Features For Survey and Manage Species Common to All Action Alternatives

1. Mollusk

These management scenarios are based on our current understanding of these species from the past four years of study and surveys which include:

- These mollusks are known to have survived a wide range of disturbance types, such as thinning and clear-cut harvesting, but may be negatively impacted by fire treatments and eradication of big-leaf maple.
- Populations seem generally resilient to past land management practices.
- Populations can benefit from timber harvesting if most big-leaf maples are retained and CWD requirements are met or exceeded.
- The climate of this region provides cool, damp conditions for most of the year, so management for mollusk sites are not focused on microclimate.

The following treatment levels were developed with the objective of maintaining local mollusk population viability and distribution:

• Treatment Level 1

For areas where there are high concentrations (rate of four or more locations per 40 acres), retain the site tree(s) and a ring of trees within 25 feet of the site. If there are any outstanding habitat features such as old bigleaf maples or large concentrations of old woody debris (logs in decay classes 3-5), then those features would be protected by retention trees to protect them from “ground disturbing activities”. Non-exceptional sites could be operated over, but approximately half of the known sites would have a ring of trees retained.

• Treatment Level 2

For areas where there are moderate concentrations (rate of between one and four sightings per 40 acres), approximately one half of the known sites would be given protective buffers, and the other half would be managed as in Level One. Protective buffers involve the following: If the planned activity is a thinning harvest, then its buffer would have a radius of about 55 feet (or an area of 0.2 acres). If the planned activity is a regeneration harvest, then the buffer would have a radius of about 120 feet (1 acre).

• Treatment Level 3

For areas where there are low concentrations (rate of one or fewer locations per 40 acres), it is recommended that most known locations be given protective buffers. Protective buffers would be as described in Protection Level Two.

Number of Species per Treatment Level			
Species	Treatment Level 1	Treatment Level 2	Treatment Level 3
Megomphix	26	22	2
Blue-Gray tail-droppers	108	42	0
Papillose tail-droppers	0	8	11

2. Fungi

The following mitigations were developed with the objective of maintaining the fungi and moss species population viability and distribution across the watershed.

Fungi species that are seen to be fairly common within an area i.e., four or more locations per 100 acres such as *H. compressa*, more than ten sites on the district and are considered to be more common than thought at the time the NFP was written by taxon leads, are maintained by retaining at least 50 percent of the sites across a harvest area. Sites that occur in areas not harvested (such as riparian reserves and special habitat) are included in that count. Sites that are recognized as exceptionally good habitat (have large number of fruiting bodies) have a 120 foot buffer placed around them (two of these sites occurred).

Fungi species that are only known from a few sites (ten or less) across the Eugene District have a 120 foot buffer placed around them to prevent disturbance to the duff and litter layers, and retain the host trees (*Helvella elastica* and *Sarcosoma latahense*). As the management recommendations for *Sarcosoma mexicana* call for a protection buffer at occupied sites, all sites of *Sarcosoma mexicana* have a minimum buffer of 60 to 120 feet.

3. Moss

Ulota meglospora, no buffers or reserves are required for this species. As it is not disjunct or localized, its presence in riparian reserves and administratively withdrawn areas provides sufficient protection.

APPENDIX B

HARVEST UNIT DETAILS FOR THE PROPOSED ACTION

Unit	Land Use Allocation	Legal	Total Acres	Volume/Acre (MBF)	Total Volume (MBF)	Treatment Type	Harvest system / (acres)	Timber Age
#2A	GFMA	20-1-3	19	7.5	143	Thin	Skyline (13) Tractor (6)	50
#2A	RR	20-1-3	4	2.5	10	DMT	Skyline (4)	50
#2B	GFMA	20-1-3	40	35	1400	Regen.	Skyline (27) Tractor (13)	120
#4A	GFMA	19-1-33	20	35	700	Regen.	Tractor (20)	68
#5A	GFMA	20-1-5	124	7.5	930	Thin	Skyline (61) Tractor (63)	53
#5B	RR	20-1-5	2	2.5	5	DMT	Tractor (2)	53
#6	GFMA	20-1-9	29	35	1015	Regen	Tractor (29)	58
#7	GFMA	20-1-17 20-1-9	190	7.5	1425	Thin	Skyline (163) Tractor (27)	43
#7	RR	20-1-17	12	2.5	30	DMT	Skyline (7) Tractor (5)	43
#8	RR	20-1-21	25	2.5	63	DMT	Skyline (23) Tractor (2)	53
#8	GFMA	20-1-21	183	7.5	1373	Thin	Skyline (95) Tractor (88)	53
#9	GFMA	20-1-21	30	35	1050	Regen.	Skyline (4) Tractor (26)	88
#10	RR	20-2-1	9	2.5	23	DMT	Skyline (9)	48
#10	GFMA	20-2-1	26	7.5	195	Thin	Skyline (23) Tractor (3)	48
#11	GFMA	19-2-23	57	7.5	427	Thin	Skyline (38) Tractor (19)	50
#11	RR	19-2-23	12	2.5	30	DMT	Skyline (10) Tractor (2)	50
#12	CONN	19-2-35	71	7.5	532	Thin	Skyline (31) Tractor (40)	48
#12	RR	19-2-35	6	2.5	15	DMT	Skyline (6)	48
#13	GFMA	19-2-23	20	7.5	150	Thin	Skyline (17) Tractor (3)	40-50
#14	GFMA	20-1-17	13	35	455	Regen	Skyline (10) Tractor (3)	88

HARVEST UNIT DETAILS FOR ALTERNATIVE III

Unit	Land Use Allocation	Legal	Total Acres	Volume/Acre (MBF)	Total Volume (MBF)	Treatment Type	Harvest system / (acres)	Timber Age
#2A	GFMA	20-1-3	19	7.5	143	Thin	Skyline (13) Tractor (6)	50
#2B	GFMA	20-1-3	40	35	1400	Regen.	Skyline (27) Tractor (13)	120
#4	GFMA	19-1-33	20	35	700	Regen.	Tractor (20)	68
#5	GFMA	20-1-5	94	7.5	930	Thin	Skyline (61) Tractor (63)	53
#6	GFMA	20-1-9	29	35	1015	Regen	Tractor (29)	58
#7	GFMA	20-1-17	190	7.5	1425	Thin	Skyline (34) Tractor (5) Heli (151)	43
#8	GFMA	20-1-21	183	7.5	1373	Thin	Skyline (95) Tractor (88)	53
#9	GFMA	20-1-21	30	35	1050	Regen.	Skyline (4) Tractor (26)	88
#10	GFMA	20-2-1	26	7.5	195	Thin	Skyline (23) Tractor (3)	48
#11	GFMA	19-2-23	57	7.5	427	Thin	Skyline (38) Tractor (19)	50
#12	CONN	19-2-35	55	7.5	532	Thin	Skyline (31) Tractor (40)	48
#13	GFMA	19-2-23	20	7.5	150	Thin	Skyline (17) Tractor (3)	40-50
#14	GFMA	20-1-17	13	35	455	Regen	Heli (13)	88
#15	GFMA	19-1-31	20	35	700	Regen	Heli (20)	88

DMT = Density Management Thinning
 Regen. = Regeneration Harvest
 Thin = Commercial Thinning

APPENDIX C

ROAD CONSTRUCTION AND CLOSURE SUMMARY FOR ALTERNATIVE I

The following Proposed Actions would be accomplished under timber sales covered by this EA. The recommendation to close these roads incorporated information from the Lost Creek Watershed Analysis and the Lost Creek Interdisciplinary Team.

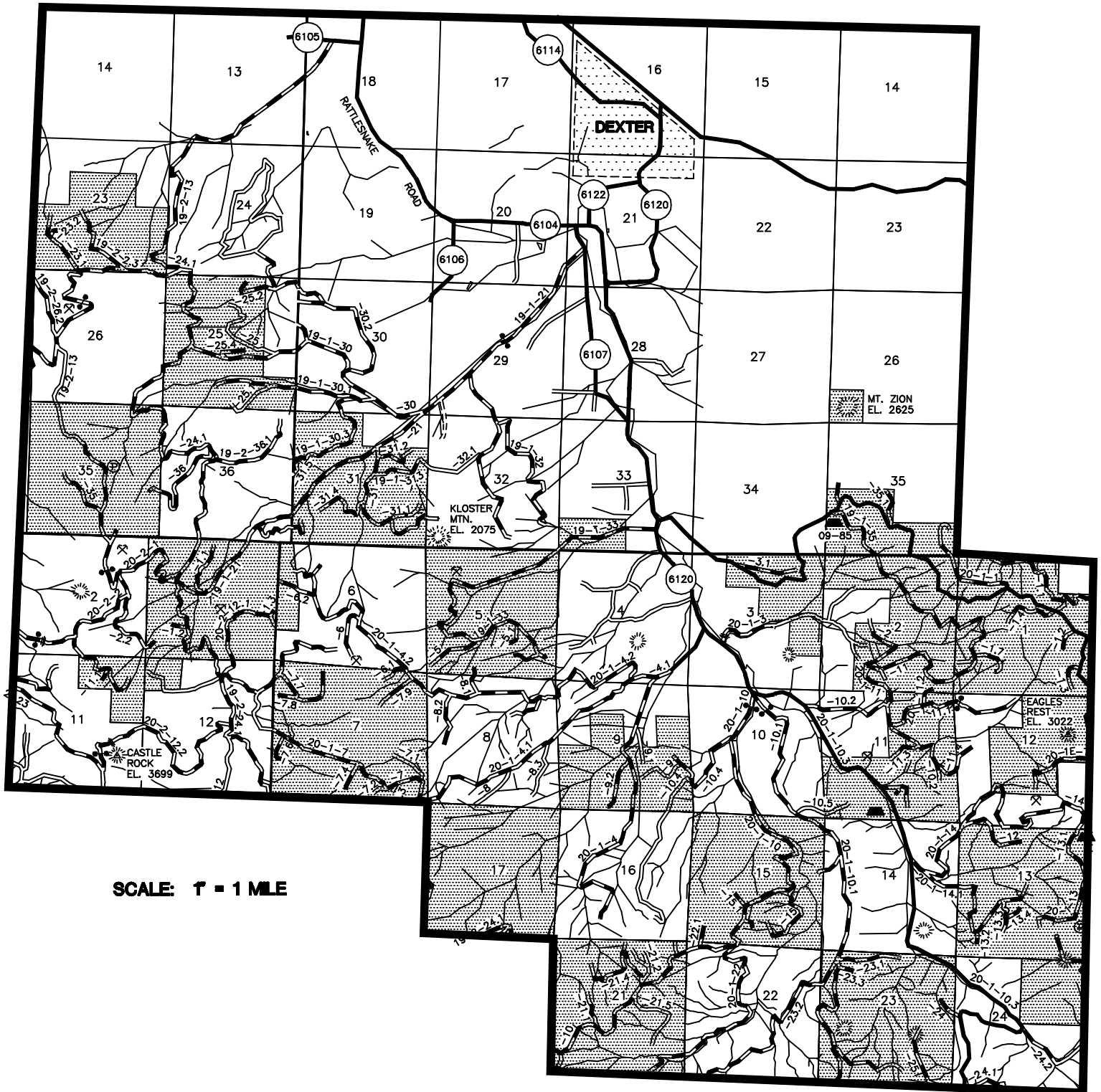
Unit #	Road No.	Miles Dirt Const.	Miles Rock Const.	Miles Dirt Road Renovation	Miles Rock Road Improv.	Total Culverts Replaced / or New Culverts / or Removed	Total Miles Decom.	Total Miles Full Decom.
1.								
2.	20-1-3.1 & Spur 1		0.04	0.15		4 - remove	0.45	
4.	Spur 4 & Skid Trail	0.27				0		0.27
5.	Spur 3 & 3A, 19-1-31.1A, 19-1-31.1B, Spur 1, 5F Skid trail	1.04		0.47		6 - new 6 - remove	1.29	0.23
6.	20-1-9.3, Spur 1	0.25				1 - new 1 - remove	0.08	0.17
7.	Spur 1, Spur 2, Spur 2A, Spur 3	2.18				8 - new 8 - remove	2.18	
8.	20-1-21.5, cat rd., Spur 3, Spur B1, Spur B2, Spur C1, Spur C2	0.64		0.95		2 - new 4 - remove	1.23	0.36
9.	20-1-21.2, 20-1-21.3, 20-1-21.4, 20-1-21.6	0.06		0.36		2 - new 10 - remove		1.57
10.	20-2-1.0A, Spur 1, 19-2-24.1	0.03			0.64	2 - Replacements 5 - new 4 - remove	0.38	0.03
11.	19-2-23					6 - remove	0.40	0.35
12.	Spur 1, Spur 2, Spur 3, 19-2-13.0G, 20-2-1.0E, 20-2-1.0D	0.76			1.21	9 - new 3 - remove	0.76	
13.	Spur 1, 20-2-12.4 / 19-2-24.1	0.09				0	0.09	
14.	Spur 1, Spur 2	0.74				1 - new 1 - remove	0.45	0.28
Flood projects	20-1-14.1B, 20-1-13.3, 20-1-13.4					1 - new 5 - remove	1.18	
TOTALS		6.34	0.04	1.93	1.85		8.77	3.25

ROAD CONSTRUCTION AND CLOSURE SUMMARY FOR ALTERNATIVE III

The following Table summarizes Alternative III actions that would be accomplished under timber sales covered by this EA.

Unit #	Road No.	Miles Dirt Const.	Miles Rock Const.	Miles Dirt Road Renovation	Miles Rock Road Improv.	Total Culverts Replaced, or New Culverts, or Removed	Total Miles Decom.	Total Miles Full Decom.
1.								
2.	20-1-3.1 & Spur 1		0.04	0.15		4 - remove	0.45	
4.	Spur 4 & Skid Trail	0.27				0		0.27
5.	Spur 3 & 3A, 19-1-31.1A, 19-1-31.1B, Spur 1, 5F Skid trail	0.63				2 - new 2 - remove	0.40	0.23
6.	20-1-9.3, Spur 1	0.25				1 - new 1 - remove	0.08	0.17
7.	Spur 1, Spur 2, Spur 2A, Spur 3	0.57				2 - new 2 - remove	0.57	
8.	20-1-21.5, cat rd., Spur 3, Spur B1, Spur B2, Spur C1, Spur C2	0.64		0.63		2 - new 4 - remove	1.23	0.36
9.	20-1-21.2, 20-1-21.3, 20-1-21.4, 20-1-21.6	0.06		0.36		2 - new 10 - remove		1.57
10.	20-2-1.0A, Spur 1, 19-2-24.1	0.03			0.64	2 - Replacements 5 - new 4 - remove	0.38	0.03
11.	19-2-23					6 - remove	0.40	0.35
12.	Spur 1, Spur 2, Spur 3, 19-2-13.0G, 20-2-1.0E, 20-2-1.0D	0.38			1.21	7 - new 1 - remove	0.38	
13.	Spur 1, 20-2-12.4 / 19-2-24.1	0.09				0	0.09	
14.	Spur 1, Spur 2	0.74				1 - new 1 - remove	0.45	0.28
Flood projects	20-1-14.1B, 20-1-13.3, 20-1-13.4					1 -new 5 - remove	1.18	
TOTALS		3.66	0.04	1.14	1.85		5.61	3.25

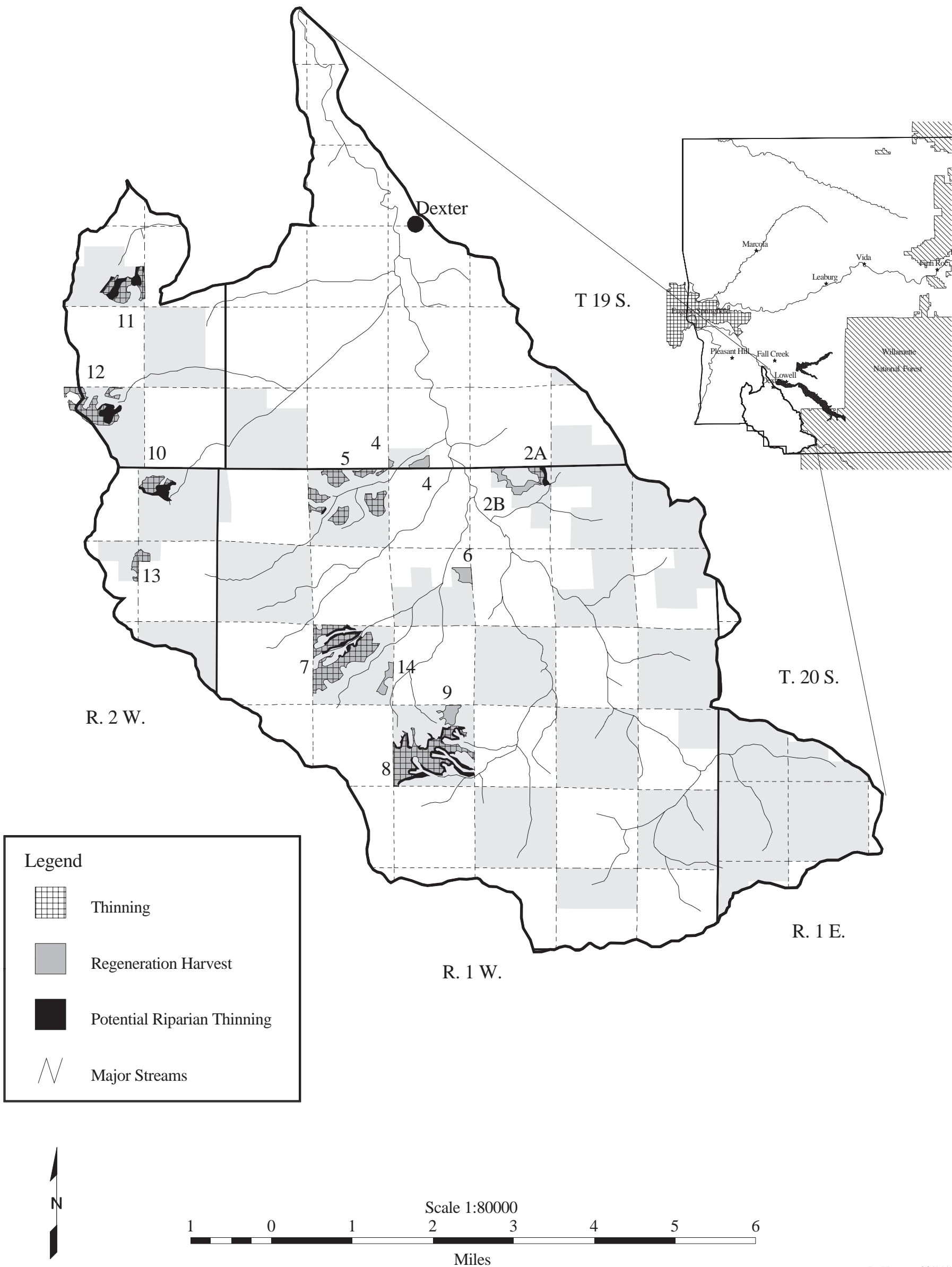
LOST CREEK AREA





Lost Creek Watershed

Alternative 1



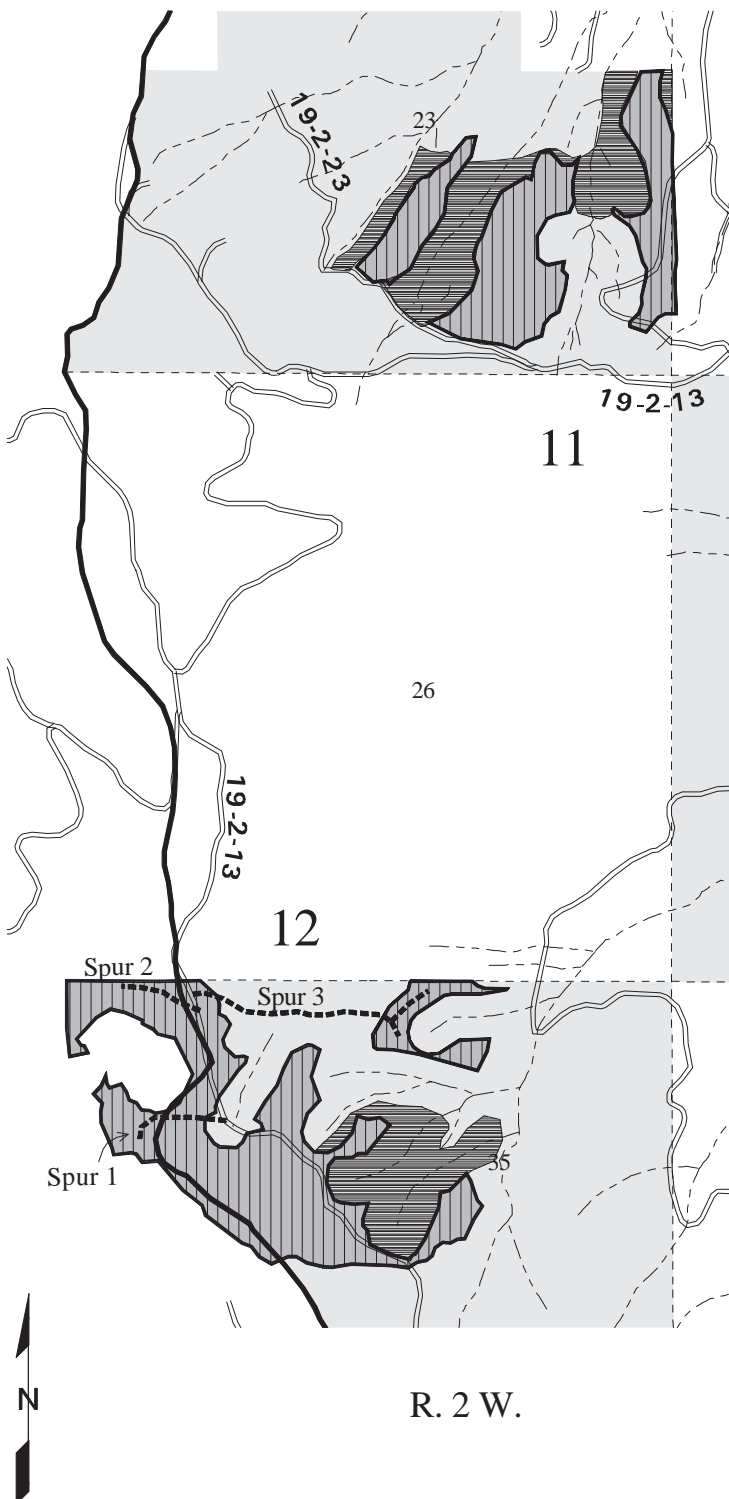
Lost Creek Area

Alternative 1

Map 1

Units 11 & 12

T 19 S.



Legend



Thinning



Regeneration Harvest



Riparian Thinning



Streams



Existing Roads



Proposed Roads

Scale 1:20000

1000 0 1000 2000 3000 4000 5000

Feet

Lost Creek Area Alternative 1

Map 2

Units
10 & 13

T 20 S.

R. 2 W.

Legend



Thinning



Regeneration Harvest



Riparian Thinning



Streams



Existing Roads

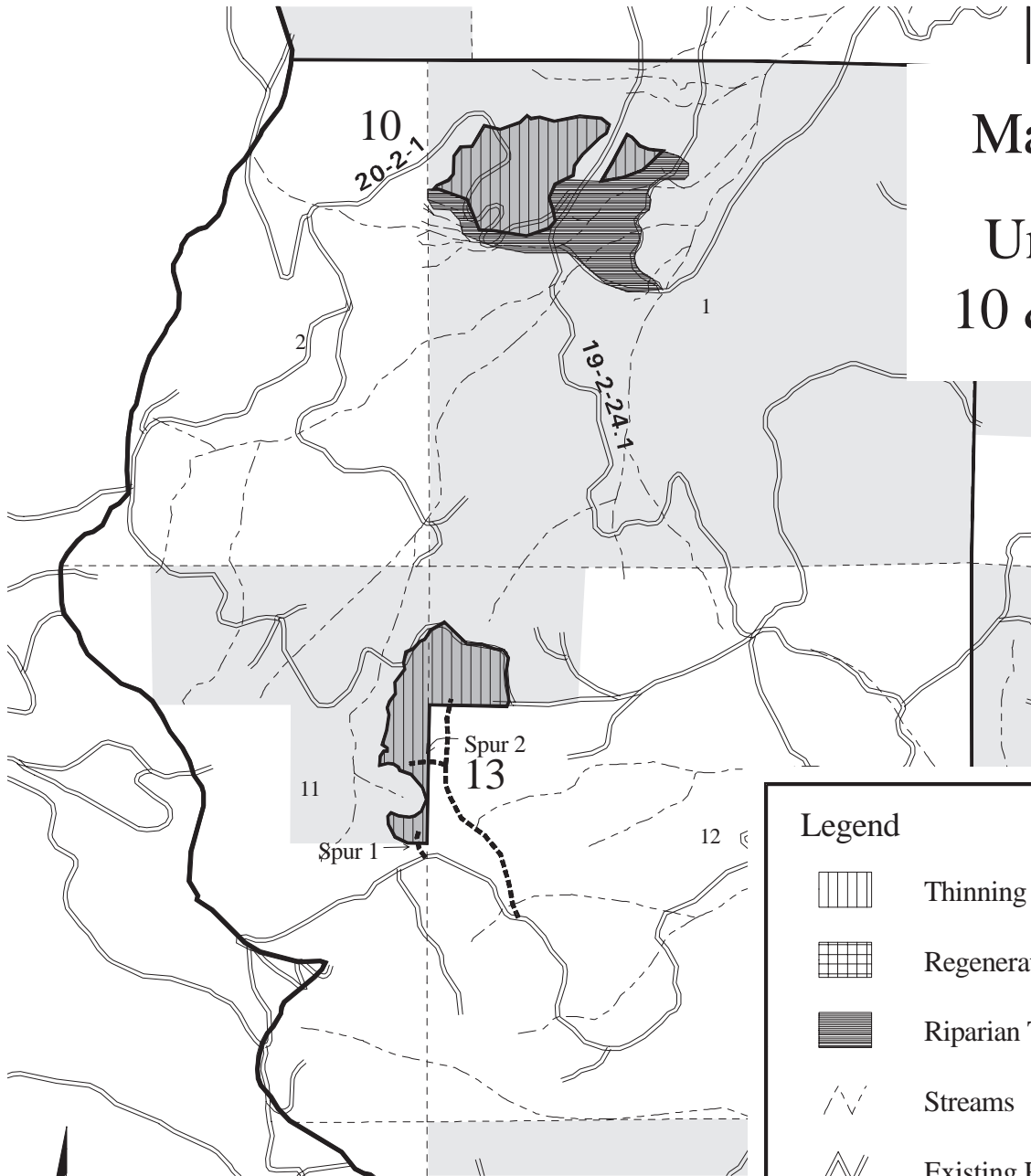


Proposed Roads

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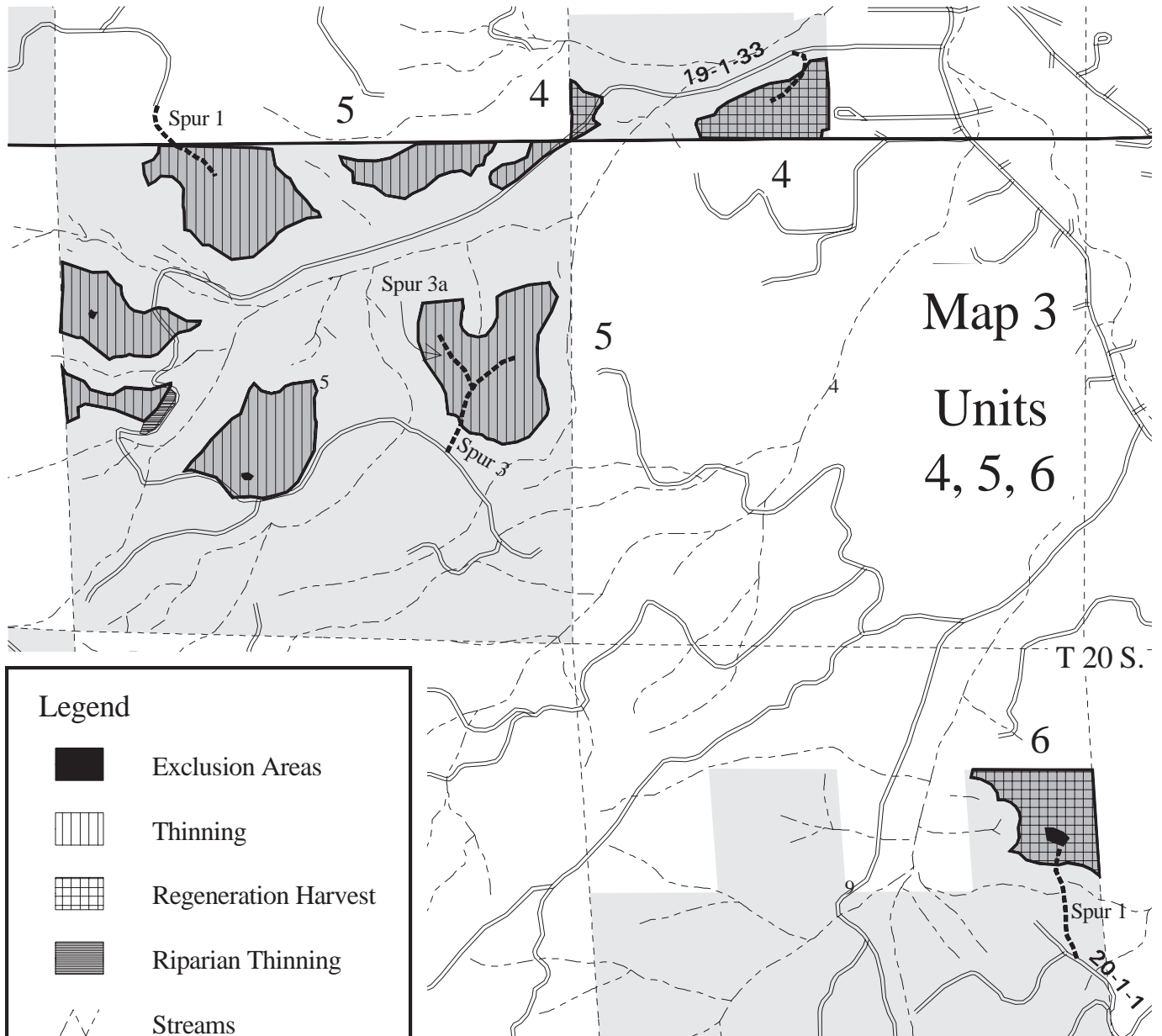
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Feet










Lost Creek Area Alternative 1

Map 3
Units
4, 5, 6



Legend

-  Exclusion Areas
-  Thinning
-  Regeneration Harvest
-  Riparian Thinning
-  Streams
-  Existing Roads
-  Proposed Roads

R. 1 W.



Scale 1:20000

1000 0 1000 2000 3000 4000 5000

Feet

Lost Creek Area Alternative 1








Map 4

Units
7, 8, 9,
& 14

T 20 S.

R. 1 W.

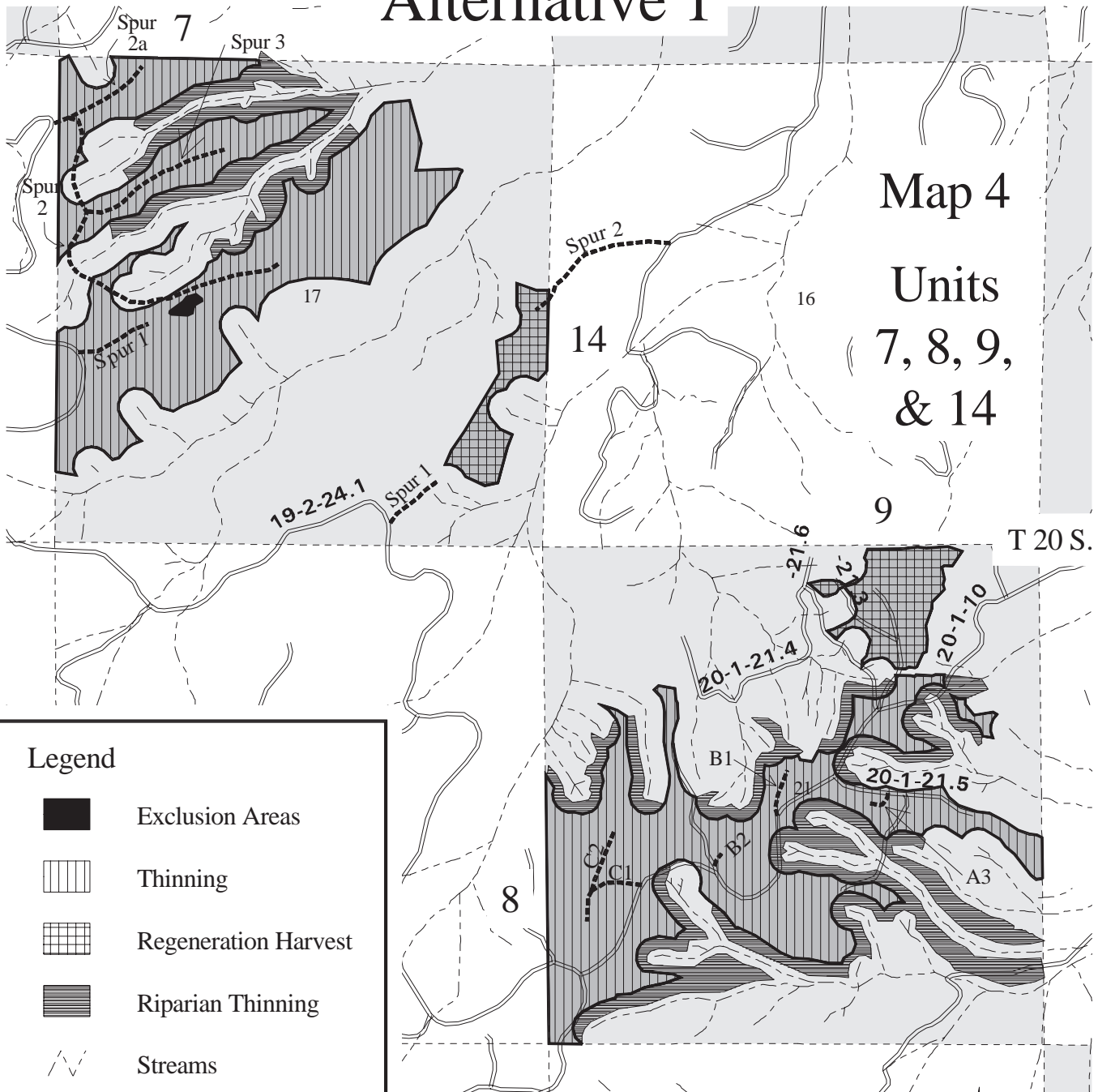
Legend

-  Exclusion Areas
-  Thinning
-  Regeneration Harvest
-  Riparian Thinning
-  Streams
-  Existing Roads
-  Proposed Roads

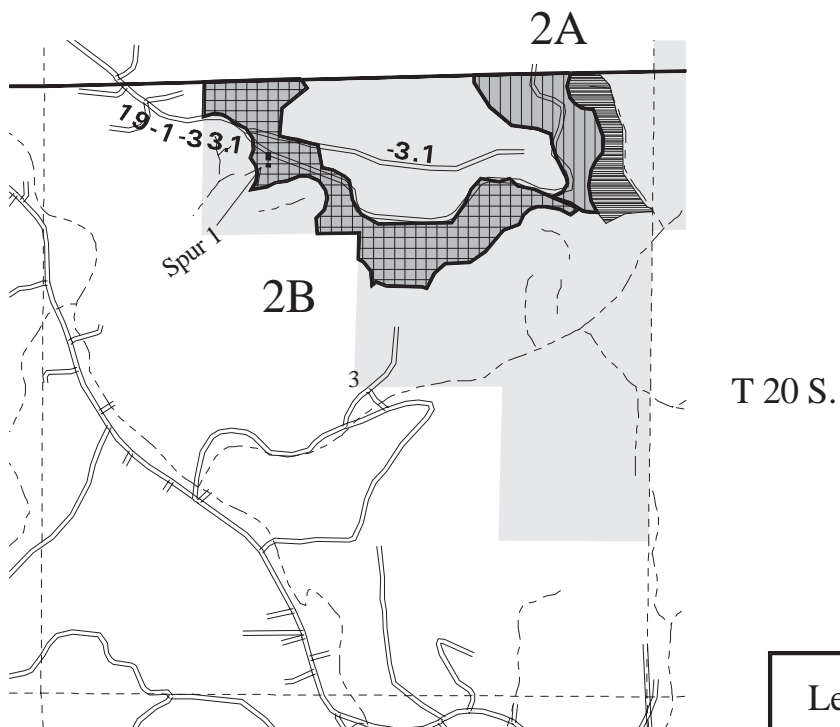
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Feet



Lost Creek Area Alternative 1



R. 1 W.

Map 5

Units
2A, 2B



Legend



Thinning



Regeneration Harvest



Riparian Thinning



Streams



Existing Roads



Proposed Roads

Scale 1:20000

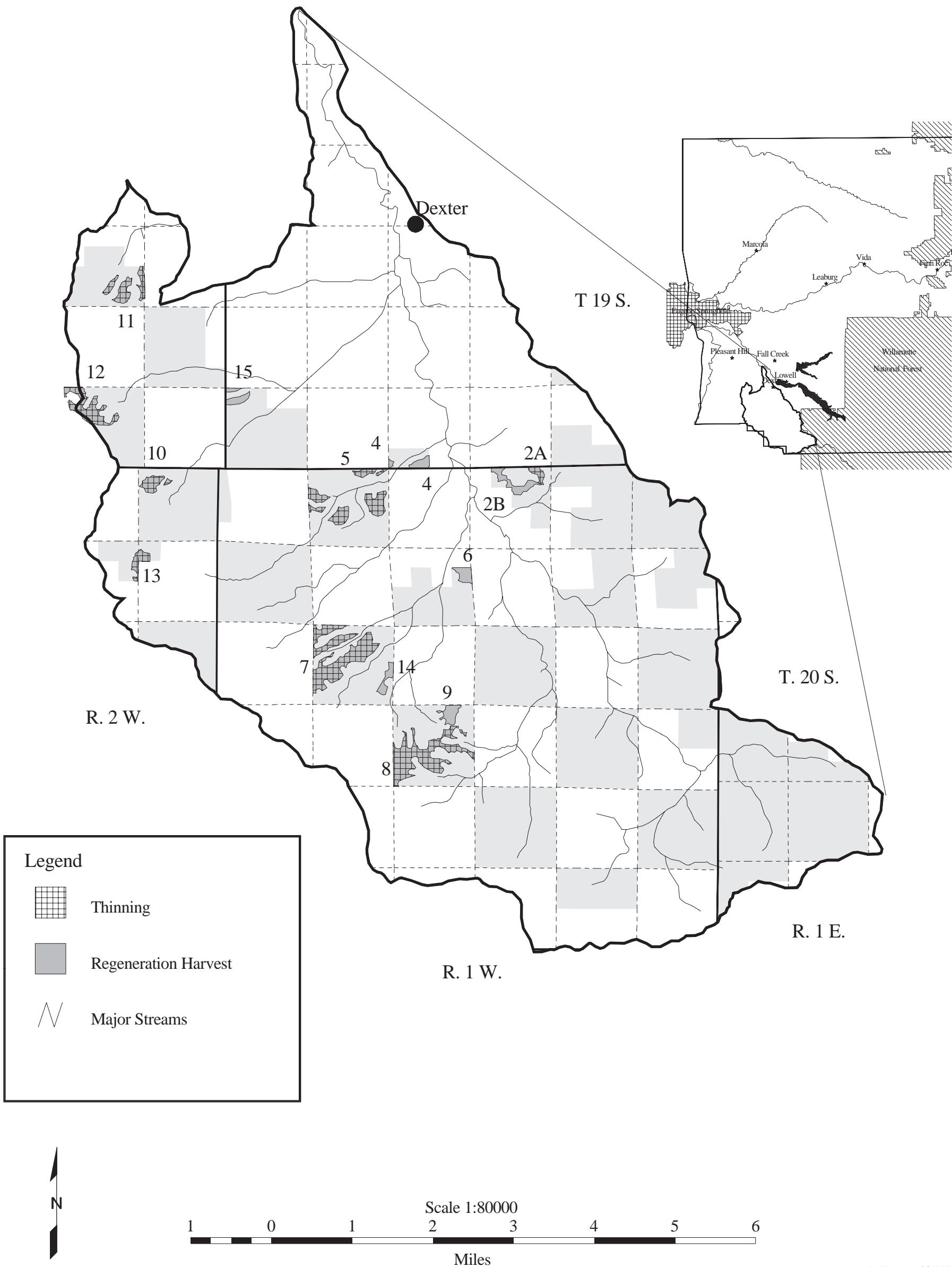
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Feet



Lost Creek Watershed

Alternative 3



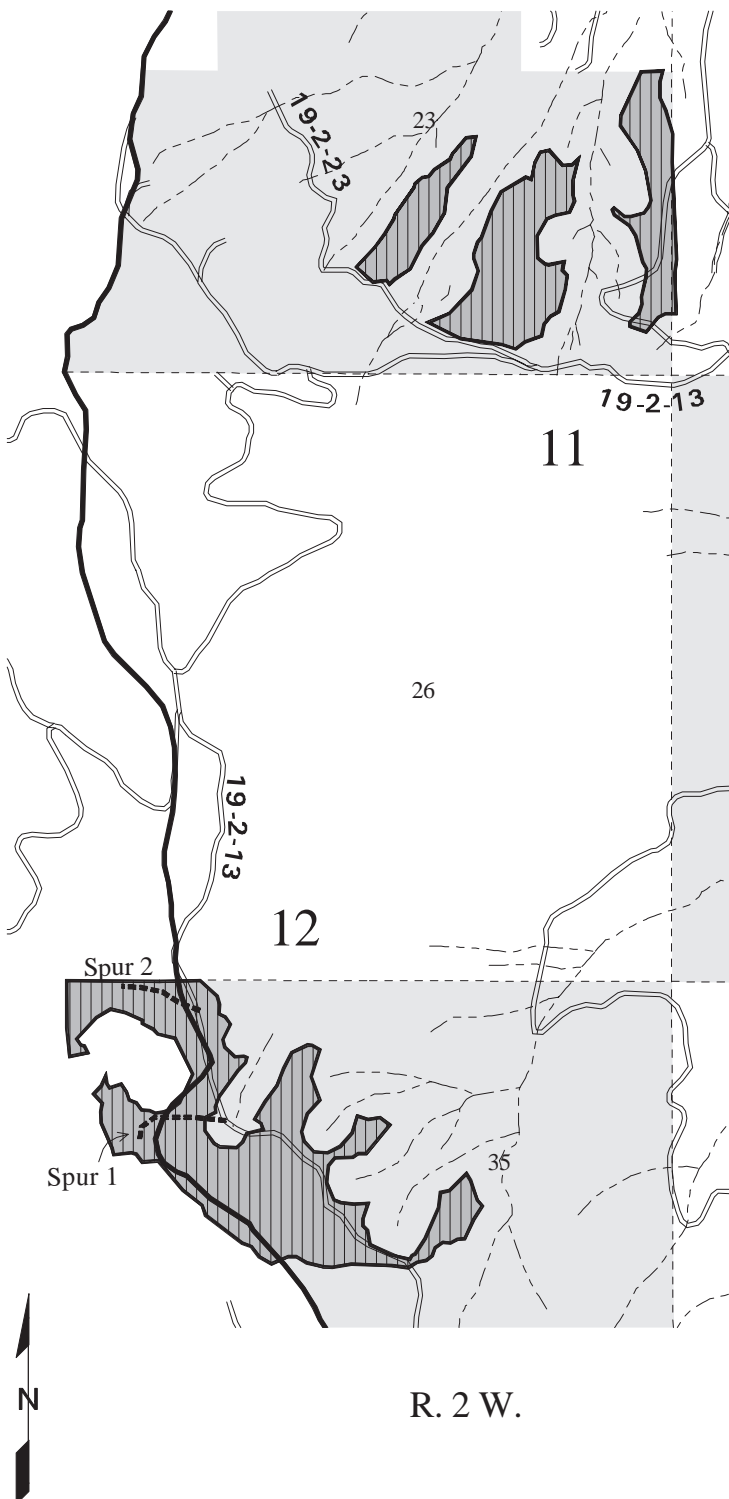
Lost Creek Area

Alternative 3

Map 1

Units 11 & 12

T 19 S.



Legend



Thinning



Regeneration Harvest



Streams



Existing Roads



Proposed Roads

Scale 1:20000

1000 0 1000 2000 3000 4000 5000

Feet

Lost Creek Area Alternative 3

Map 2

Units
10 & 13

T 20 S.

R. 2 W.

Legend



Thinning



Regeneration Harvest



Streams



Existing Roads



Proposed Roads



Scale 1:20000

1000 0 1000 2000 3000 4000 5000

Feet

Lost Creek Area Alternative 3

Map 3

Units
4, 5, 6

Legend

-  Exclusion Areas
-  Thinning
-  Regeneration Harvest
-  Streams
-  Existing Roads
-  Proposed Roads

R. 1 W.

T 20 S.

Scale 1:20000

1000 0 1000 2000 3000 4000 5000

Feet



Lost Creek Area

Alternative 3

Map 4

Units
7, 8, 9,
& 14

T 20 S.

R. 1 W.

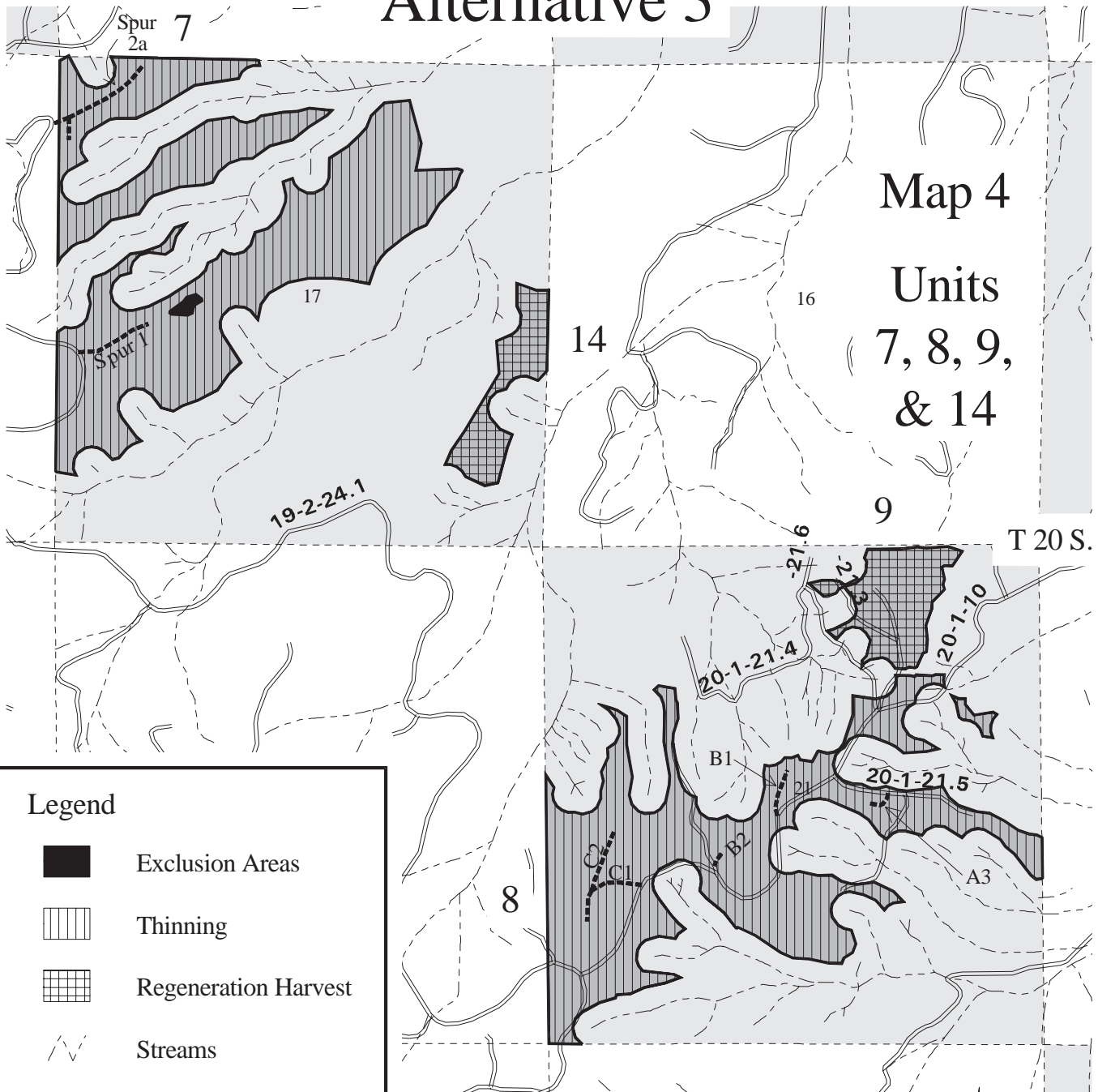
Legend

-  Exclusion Areas
-  Thinning
-  Regeneration Harvest
-  Streams
-  Existing Roads
-  Proposed Roads

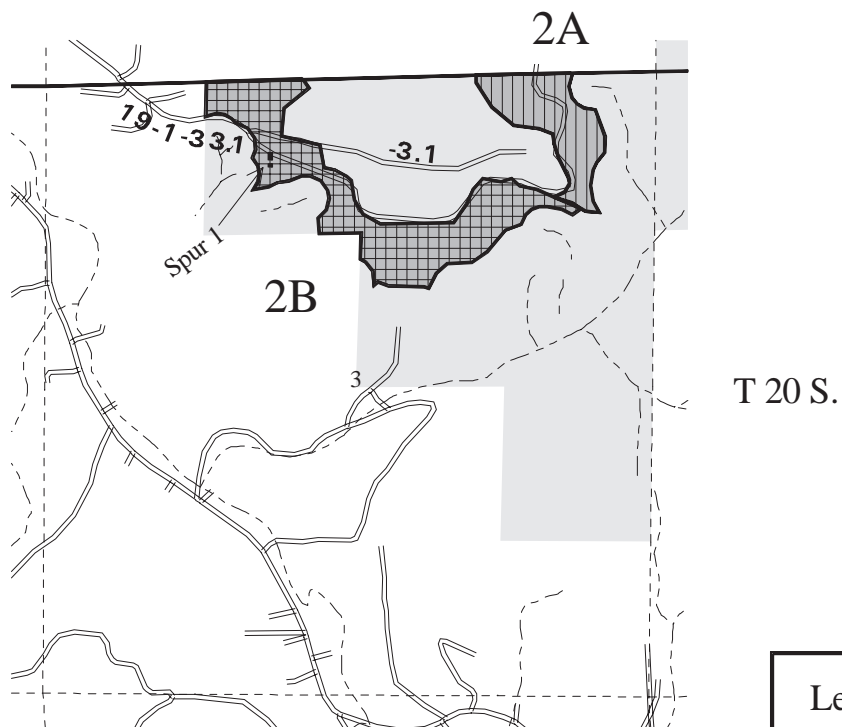
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


Feet



Lost Creek Area Alternative 3



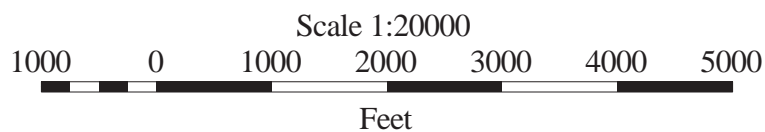
Legend

-  Thinning
-  Regeneration Harvest
-  Streams
-  Existing Roads
-  Proposed Roads

R. 1 W.

Map 5

Units
2A, 2B



Lost Creek Watershed

Critical
Habitat
Unit

T 19 S.

11

12

10

13

R. 2 W.

T. 20 S.

5

4

2A

4

2B

6

7

14





9

8

R. 1 W.

R. 1 E.

Legend

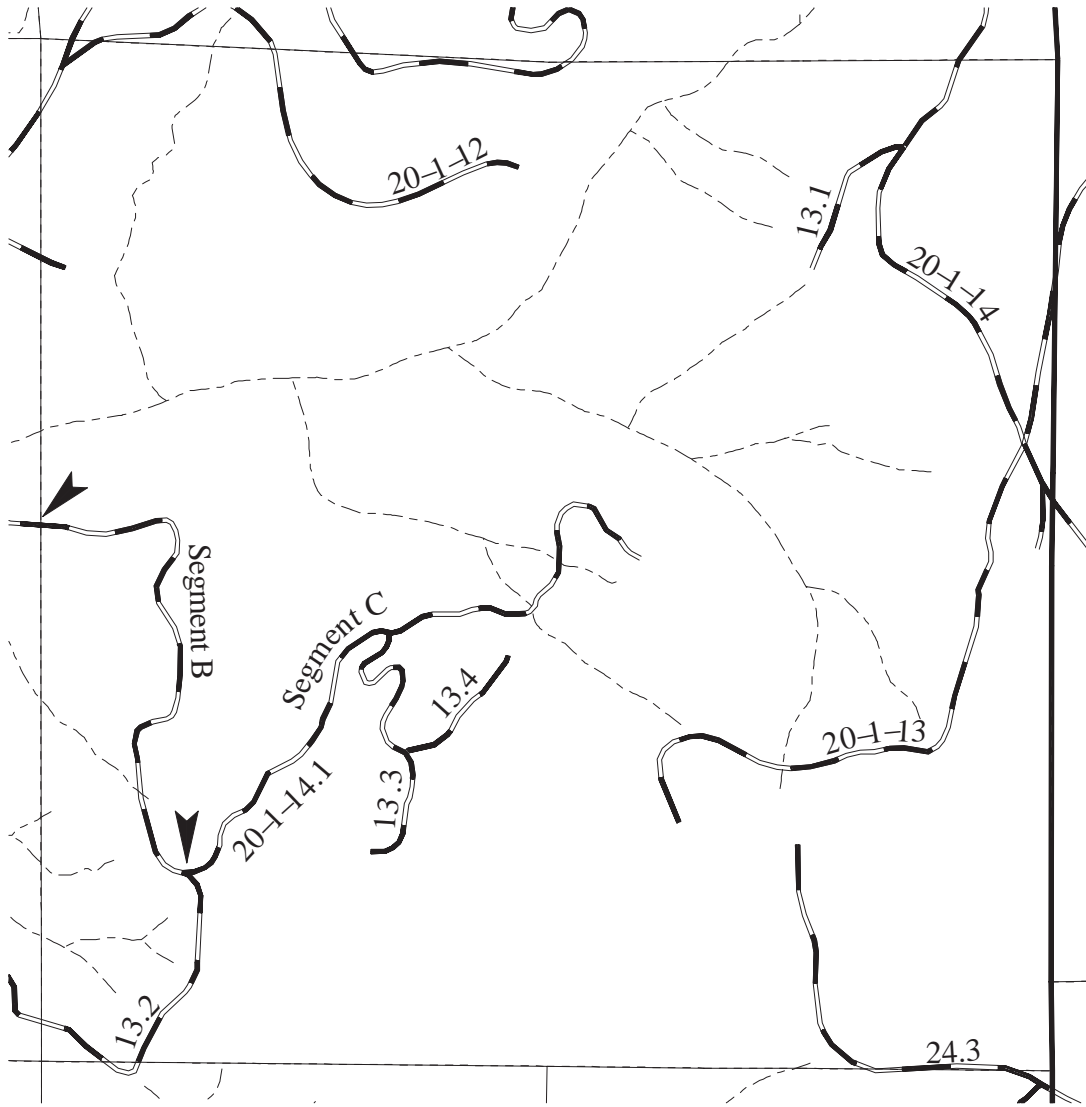
-  Critical Habitat Unit
-  Lost Creek Sales
-  BLM Lands
-  Major Streams

Scale 1:100000

1 0 1 2 3

Miles

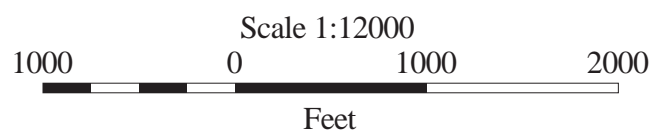
N



Road 20 -1 -14.1

- Ownership
- - - Streams
- == Roads

T. 20 S, R. 01 W, Sec 13



Aquatic Conservation Strategy Objectives

Forest Service and BLM-administered lands within the range of the northern spotted owl will be managed to:

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.
2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.
3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.
5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of

sediment input, storage, and transport.

6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

The Finding of No Significant Impact (FONSI) is not a decision document. Its purpose is to state that the actions proposed do not have a significant effect on the environment and that an EIS is not needed according to information contained in the EA and other available information. The unsigned FONSI is sent out with the EA to let you know that we feel that our actions do not warrant an EIS.

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
EUGENE DISTRICT**

**1792A
EA-98-20
Lost Creek**

Preliminary Finding of No Significant Impact

Lost Creek Analysis Area EA OR 090-98-20

The Interdisciplinary Team for the McKenzie Resource Area, Eugene District, Bureau of Land Management has completed an Environmental Assessment (EA) and analyzed the effects of (1) harvesting timber, (2) road construction, improvement, and decommissioning, (3) riparian treatments, and (4) creation of snags in the analysis area. The proposed harvest activities are located in T. 19 S., R. 3 W. ; T. 19 S., R. 2 W. ; T. 19 S., R. 1 W. ; T. 20 S., R. 3 W. ; T. 20 S., R. 2 W. and R. 20 S., R. 1 W.; T. 20 S., R. 1 E. of the Willamette Meridian.

The design features of the Proposed Action are described in the appendix of the Lost Creek Analysis Area Environmental Assessment (EA OR 090-98-20). The Proposed Action and Alternatives are in conformance with the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (April 1994), and the Eugene District Record of Decision and Resource Management Plan (May 1995).

The anticipated environmental effects contained in this EA are based on research, professional judgement, and experience of the Interdisciplinary (ID) team and Eugene District Resources staff. No significant adverse impacts are expected to (1) Threatened or Endangered species, (2) Flood plains or Wetlands/Riparian areas, (3) Wilderness Values, (4) Areas of Critical Environmental Concern, (5) Cultural Resources, (6) Prime or unique Farmland, (7) Wild and Scenic Rivers, (8) Air Quality, (9) Native American Religious Concerns, (10) Hazardous or Solid Waste, or (11) Water Quality.

DETERMINATION

On the basis of information contained in the EA, and all other information available to me, it is my determination that the Alternatives analyzed do not constitute a major Federal action affecting the quality of the human environment. Therefore, a new EIS or supplement to the existing EIS is unnecessary and will not be prepared for this proposed timber sale.

***Approved by: _____
Area Manager, McKenzie Resource Area***

Date: _____